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# Delaware Journal of Public Health

*A publication of the Delaware Academy of Medicine / Delaware Public Health Association*



## DISASTER PREPAREDNESS



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The Delaware Journal of Public Health (DJPJ), first published in 2015, is the official journal of the Delaware Academy of Medicine / Delaware Public Health Association (Academy/DPHA).

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**COVER**

From preventive flu vaccination to evacuation routes and emergency preparedness drills, the work of preparing for the worst is never done. Our national and state preparedness is the shared responsibility

of all levels of government, the private and nonprofit sectors, and individual citizens.



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# IN THIS ISSUE

Dear Reader,

There is a phenomena before a winter storm - runs on the supermarket for bread, milk, and other essentials; and if the word "blizzard" is uttered, for all manner of snow removal equipment, generators, etc. If prescriptions are running low, maybe a run to the pharmacy for a refill. And for the consumers of alcohol-containing beverages - a likely stop by the store to stock up. That same behavior-inducing action operates on a lower level if the weather forecast calls for rain...we close windows, grab our umbrella, and maybe our rain gear. In all cases, hopefully we adjust our driving habits (or abstain from driving at all until the storm has passed. All of these actions are preparedness, and in the case of driving, very active "engagement and response" with the conditions as they present themselves.

These actions which we take for ourselves, and on behalf of our families and loved ones, are the proverbial "tip of the iceberg" of the much larger processes that public health, transportation, power companies, hospitals, local, state, and federal entities, and many others take in preparation. And all that is only in regard to the weather. In the words of Benjamin Franklin: "By failing to prepare, we are preparing to fail." And failure is not an option.

One could argue preparedness is a state of mind and resources - aligned and coordinated for maximum response against all manner of threats. That is what this issue of the Journal is about. This has been a special issue to coordinate, and we want to recognize one individual for their tireless work pulling all of this together - Donna Sharp. Donna's official title of "Events Coordinator" for the Division of Public Health doesn't quite expand to encompass her passion for public health and Delaware, nor her encyclopedic connections to anyone and everyone.

Donna, thank you.



Donna Sharp

As always we look forward to your feedback, suggestions for future issues, and wish you good health as we enter into the winter holiday season.



Timothy E. Gibbs, M.P.H.  
Executive Director



Omar A. Khan, M.D., M.H.S.  
President

# Guest Editors

Timothy R. Cooper, M.A., C.E.M. and Rick Hong, M.D.  
Division of Public Health

We are excited and honored to serve as guest editors for this special edition focused on preparedness. The Delaware Department of Health and Social Services (DHSS), Division of Public Health (DPH) works with its partners in developing plans, conducting preparedness outreach and training, and participating in drills and exercises. This issue comes during a busy time in emergency preparedness. In September, Hurricane Dorian's Category 5 fury caused unfathomable destruction in the Bahamas. Closer to home, DPH hosted a three-day graded preparedness exercise that involved multiple sites and 400 state employees and volunteers from the Delaware Medical Reserve Corps and the community. By the end of October, DPH will have participated in a multi-state regional preparedness exercise. Drills like these test our readiness to respond to a public health emergency and to dispense emergency medications during such a response. Among our preparedness activities, DPH also recently hosted the 15th Family Preparedness Day in Dover with its partners, and is now holding statewide flu clinics (the largest of which follow DPH preparedness procedures), to remind Delawareans to get their annual flu vaccination to prevent illness and hospitalizations.

Public health preparedness vaulted to a historic height following the September 11, 2001 attacks and the anthrax release through the U.S. Postal Service, which created a need to develop public health preparedness programs around the country.<sup>1</sup> Funding from the Centers for Disease Control and Prevention (CDC), Office of State and Local Readiness, Public Health Emergency Preparedness Program, permits DPH to operate its Office of Preparedness within the Emergency Medical Services and Preparedness Section, and to respond to public health emergencies or crises and/or respond to the health impacts of natural or technological disasters. DPH maintains a constant state of readiness with the Delaware Emergency Management Agency (DEMA) and other response and recovery partners.

In addition, DPH provides critical emergency response and recovery functions. Readers may find it reassuring to know that DPH's several hundred staff are assigned special response duties to support a division-wide response infrastructure called the State Health Operations Center (SHOC), as well as operations in the field such as setting up and staffing community shelters, Points of Dispensing, and high consequence infectious disease responses. The DPH director activates SHOC based on the size and scope of the emergency or disaster and the services needed. During a SHOC activation, more than 200 personnel from DPH and other state agencies may be required to support a public health emergency or disaster response. SHOC works closely with the State Emergency Operations Center (managed by DEMA) to ensure that the health care system is operational, that information is shared with health partners, and that DHSS maintains critical services during and following a disaster.

The Delaware Emergency Operations Plan, which defines state agency roles, tasks DHSS with several responsibilities, including Mass Care, which is the emergency support to residents who seek shelter during an evacuation. The DHSS Disaster Committee meets quarterly to ensure that all DHSS divisions can maintain their delivery of critical and necessary services during a disaster with public health impacts, such as hurricanes and flooding, or a public health emergency, such as a chemical leak or a disease outbreak. Another DHSS duty is to assist DEMA and the Delaware National Guard (DNG) in supporting Radiation Reception Centers to screen residents for radiation contamination from a nuclear incident.

These pages provide more information and indispensable resources to help Delaware's households and businesses be more prepared for whatever is next. Do not procrastinate when it comes to emergency plans; prepared Delawareans will recover from emergencies faster and more easily than those who are not.

We would like to thank the Delaware Journal of Public Health for this opportunity to share our preparedness information. Moreover, we are grateful to our many partners who not only helped by submitting articles to this edition, but who make our communities safe each day. This includes all sections of DPH, all DHSS divisions, DEMA, our state and city emergency management agencies, first responders, community organizations, the DNG, the Delaware Department of Transportation, our state and local public safety agencies, and our health care partners.

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Timothy R. Cooper, M.A., C.E.M.  
Director, Office of Preparedness  
Emergency Medical Services and Preparedness Section  
Division of Public Health  
Delaware Department of Health and Social Services



Rick Hong, M.D.  
Medical Director, Division of Public Health and Office of Preparedness  
Delaware Department of Health and Social Services

*Ranelle Lowry of the Division of Public Health greets members of the Delaware National Guard who volunteered at the Medical Countermeasures Distribution and Dispensing preparedness exercise in September 2019. Representing the 1049th Transportation Company, 72nd Troop Command Brigade are, from left: PFC John Bessel, SPC Michael Taylor, and PFC Noah Conner. Photo by Donna Sharp.*



DELAWARE HEALTH AND SOCIAL SERVICES  
Division of Public Health

## Statewide Emergency Exercise!

Date: Saturday, September 28, 2019  
10:00 AM - 2:00 PM



*Laurie Lin of DPH's Emergency Medical Services and Preparedness Section welcomes volunteers and staff to sign in at the Point of Dispensing (POD) at DTCC's Stanton campus. Photo by James Tracy.*



Dispensing Chief Cynthia Taylor of DPH's Southern Health Services, left, and a Delaware Medical Reserve Corps volunteer iron out dispensing details. Photo by Eric Donato.



During DPH's Medical Countermeasures Distribution and Dispensing Exercise, an actor portraying a client uses assistive technology to read the dispensing form. Photo by Eric Donato.



During DPH's exercise at the DTCC Terry Campus site in Dover, Paul Westlake of DPH's Emergency Medical Services and Preparedness Section advises the Delta staff evaluators. Photo by Eric Donato



Exercise Coordinator Shawn Foster of DPH's Office of Preparedness, standing at center, provides feedback at the hotwash to discuss what went right and wrong. Listening at far left is Elizabeth Hess and at far right is Bob Ross, both of Delta. Photo by Eric Donato.



At right, with clipboard in hand, April Cleveland of DPH's EMSPS directs staff moving medications at the DPH Warehouse. Photo by James Tracy.

*Anne Dunphy of Hockessin, Delaware, left, receives pretend medicine from Sohaib Chaudhry of Temple University's School of Pharmacy. They and hundreds of other volunteers were players in DPH's September 2019 preparedness exercise. Photo by Donna Sharp.*



*Interpreter Melodie Brown, second from right, signs to volunteer Loretta Sarro, at left, at the September 28 Medical Countermeasures Distribution and Dispensing exercise in Stanton. Looking on at right is Trina Cale-Rosario of the Division of Public Health. Photo by Donna Sharp.*



*The Operations Chief at DPH's Medical Countermeasures Distribution and Dispensing Exercise briefs dispensing staff. Liaison Officer Christi Lancellotti, second from left, dispenses labels. Photo by James Tracy.*



*Kevin Musto, Pharmacist Consultant for DPH's Emergency Medical Services and Preparedness Section, briefs pharmacist interns on dispensing medications at the PODs. Photo by Donna Sharp.*



*Volunteer Dawn Yetto of Elkton, Maryland, at left, listens carefully to Holly Schiavone of DPH's Northern Health Services. Photo by Donna Sharp.*

# Creating a Culture of Preparedness

Timothy R. Cooper, M.D., C.E.M.

Director, Office of Preparedness, Delaware Division of Public Health; Manager, Public Health Emergency Preparedness (PHEP) Grant Program; Operations Section Chief, State Health Operations Center Activation; member, International Association of Emergency Managers (IAEM)

## ABSTRACT

The culture of preparedness is about maintaining a constant state of readiness, which involves a series of planning steps to ensure individuals, families, and businesses are ready for all types of disasters that may impact the community. Some of those steps include developing plans, creating disaster kits, conducting drills and exercises, volunteering and completing training, and updating plans and kits as situations change.

Native Delawareans will unabashedly admit that they stock up on bread, milk, and gas whenever snow or hurricanes are in the forecast. Lines form at gas stations and grocery store shelves empty quickly. When hurricanes and winter storms are forecasted, there is time for citizens to take necessary steps and purchase items to protect their family. However, since some disasters occur without warning, it is best to maintain a level of readiness at all times – thereby helping support and create a culture of preparedness.

When people are asked how prepared they are for disaster, their responses vary. Some believe that as long as they have heat and a full refrigerator, they will be okay. Others are unsure or may not prioritize preparedness. Here are some guiding questions to help you assess your personal level of preparedness:

- How prepared are you for each disaster that may impact your area?
- Are you prepared differently for disasters that may affect where you live and where you work?
- Are you prepared for events that come without any warning, such as tornadoes, flash floods, and earthquakes?

Every Delawarean should think about these things, but the average citizen may not. According to Jeffrey Schlegelmilch, Director of the National Center for Disaster Preparedness,<sup>1</sup> “Nearly two-thirds (65%) of households do not have adequate plans for a disaster or have no plans at all, compared to 77% without adequate plans in 2003.”

Preparedness is not a one-time, all-hazards investment for eternity. It requires constant maintenance. At an emergency management conference several years ago, an emergency manager told the audience, “You cannot buy preparedness; you can only rent it.” Preparedness is part of a cycle of constantly reassessing hazards, updating plans and creating kits.

In the spring of 2019, in recognition of the importance of creating a culture of preparedness, the Federal Emergency Management Agency (FEMA) released its strategic plan, which identified creating a culture of preparedness as one of its primary goals. According to FEMA,<sup>2</sup> “The most successful way to achieve disaster resiliency is through preparedness, including mitigation. Building a Culture of Preparedness

within our communities and our governments will support a National effort to be ready for the worst disasters – at the individual, family, community, state, local, tribal, territorial, and Federal levels.”

“Strategic Goal 1 promotes the idea that everyone should be prepared when disaster strikes. To be prepared, however, we must all understand our local and community risks, reflect the diversity of those we serve, and foster partnerships that allow us to connect with a diverse Nation. People who are prepared will be able to act quickly and decisively in the face of disasters, thereby preventing death and injuries, minimizing loss of property, and allowing for a more rapid and efficient recovery.”<sup>2</sup>

Preparedness planning occurs on several fronts and is applicable among families, in workplaces, and for business continuity. First, create a disaster plan if one is absent, and update existing plans. Helpful disaster plan templates for families can be found at <https://www.redcross.org/get-help/how-to-prepare-for-emergencies/make-a-plan.html>. Disaster plan templates for businesses are available at [www.ready.gov/business/implementation/emergency](http://www.ready.gov/business/implementation/emergency).

Next, exercise preparedness plans and test all listed tasks with formal and informal drills. When was the last time a fire drill was held at home or at work? Identify training needs among staff. Do this annually when the clocks are moved forward or back for Daylight Savings Time. One occurs prior to the winter storm season and the other occurs in the spring prior to summer thunderstorms and hurricane season. Teach adult household members and business leaders how to activate the disaster plan.

Once plans and emergency supply kits are created, they must be regularly updated. Adjust plans when family or business members are added or depart, or when their individual needs change, such as developing difficulty walking or if they have cognitive needs. Keep emergency contact information current for all household or business members. Since perishable kit items will eventually expire, consume items before their expiration date and replace those items with fresh stock.

## PERSONAL AND FAMILY PREPAREDNESS

Every household should have a disaster plan and emergency supply kit for rapid evacuation, or when families need to

shelter-in-place at the residence. Disaster plans must include provisions for childcare, pets, and those for whom we provide assistive care, such as a parent, an older friend or neighbor, or one who has access and functional needs.<sup>3</sup> Disaster plans should also identify two evacuation locations: one locally, such as a neighbor's house; and an out of-state location. Include updated contact information for both sites within the "go bag."

An emergency kit should contain enough food and supplies to maintain the health and safety of all household residents for at least three days.<sup>3</sup> It should also include paper products, a flashlight and batteries, important documents, and a list of other essential items. (See related articles.)

In addition to keeping an emergency supply kit in the house, those who are required to respond to disasters and anyone who works outside the home should keep a "go bag" in the car or office. The "go bag" should be an easily carried bag, such as book bag, that is packed with a change of clothes, some bottled drinking water and non-perishable snacks, a cell phone charger, and back-up medications, if applicable. Those who work lengthy work shifts during a winter storm or hurricane will appreciate a properly packed "go bag." "Go bags" can also fortify non-first responders who are stuck at the office because travel is not advised or when an unforeseen disaster occurs, such as flooding or a dangerous uprising.

The FEMA National Response Framework, the nation's all hazard plan, defines the roles and responsibilities of all levels of government including the community. The National Response Framework states, "Although not formally part of emergency management operations, individuals, families, and households play an important role in emergency preparedness and response." The National Response Framework further recommends: "Individuals, families, and households should also prepare emergency supply kits and emergency plans, so they can take care of themselves and their neighbors until assistance arrives." Finally, the National Response Framework mentions the importance of volunteering, thereby creating more resilience when communities are able to help their families and their neighbors through Community Emergency Response Teams, the American Red Cross, and Medical Reserve Corps.<sup>4</sup> There are numerous opportunities to volunteer in the community with the Medical Reserve Corps, Red Cross and other community organizations. This is discussed in much detail in other sections of this issue. Volunteers gain valuable preparedness training and can be called upon to assist as part of a response effort or, if directly impacted, volunteers can assist their own families and communities until help arrives.

## PREPAREDNESS FOR HEALTH CARE WORKERS

The role of health care workers in a disaster is largely dictated by one's current position and place of work. Most employees who work at a health care facility already have an active role in the operation of that facility, as specified in its disaster

plan. Staff with unassigned clinical or disaster response roles often become part of the health care facility's emergency response team since their workplace would not be open during a public health emergency or disaster. Such staff can consider volunteering for relief and recovery organizations listed within this edition of the DJPH. Organizations, facilities, and businesses that provide critical tasks or services may be required to have emergency plans in place and to test them regularly.

## BUSINESS PREPAREDNESS

Business owners should have disaster plans in place that address the hazards that may affect their facilities, their employees, and their customers.<sup>5</sup> Retired Lieutenant General Russel Honoré, who led the military response and recovery during Hurricane Katrina, is a big proponent of preparedness.

"Being prepared starts at work because you cannot run your business without your employees," Retired Lt. General Honoré said. "...American businesses ought to wage an active campaign because a culture of preparedness cannot be created without the private sector's help." [Ready.gov/business](https://www.ready.gov/business) contains a wealth of information that business owners and staff can use to begin developing business disaster and continuity plans. This will be addressed in much more detail in the Business Continuity article contained later in this preparedness issue.

Creating a Culture of Preparedness is much more than creating an emergency supply kit and disaster plan to protect families and businesses. It means examining and preparing for all types of hazards to homes, business, and communities. Establishing a Culture of Preparedness also represents practicing the plan with formal and informal drills and exercises, and ensuring that adult family and business members are able to activate the plan. Finally, a Culture of Preparedness includes regular updates to family, business, and organizational emergency plans and emergency contact information for the ultimate protection of families and businesses.

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# The Storm of March 1962

It affected the mid-Atlantic March 6-8 as a powerful nor'easter, according to the Delaware Public Archives link below. Rehoboth Beach and our coastal areas, as well as inland areas, were devastated by that storm.

Explore one of the greatest storms ever to hit the mid-Atlantic from your computer and come in to see even more fantastic pieces of history here at the Delaware Public Archives. <https://archives.delaware.gov/2012/03/02/the-storm-of-march-1962/>



Destroyed hotels



Destroyed hotels



Milton Theater flooding



Dune breaches; aerial shot



Aerial shot of damage to Rehoboth Beach boardwalk



Huge wave seen from Delaware Avenue, Rehoboth Beach



Henlopen Hotel, Rehoboth Beach



Stuart Kingston building, Rehoboth Beach



Damaged homes, Rehoboth Beach

Photos courtesy of Delaware Public Archives Facebook page.

## October 2019

The Nation's Health headlines

[Online-only news](#) from The Nation's Health newspaper

Stories of note include:

### [Toxic algae blooms creating hazards for US public health](#)

Algae blooms are contaminating waters used for drinking and recreational purposes at alarming rates, causing human illnesses and animal deaths.

### [Video games and health: Sorting science from popular beliefs](#)

There are pros and cons to playing video games, though one often-cited concern may need to be vanquished for good.

### [Ending America's HIV epidemic: Q&A with Giroir on raising awareness, building partnerships](#)

The Nation's Health talks with HHS' Brett Giroir on the federal initiative to end HIV in America.

### [APHA Annual Meeting filled with continuing education opportunities](#)

Attendees to the Annual Meeting and Expo Nov. 2-6 in Philadelphia can earn continuing education academic credits by evaluating scientific sessions.

### [APHA: Ending gun violence requires tougher laws on guns, ownership](#)

Data show that gun availability, not mental illness, is the primary driver of firearm violence in the U.S.

### [New tool calculates human, monetary cost of not breastfeeding children](#)

Creating environments that support breastfeeding women could save hundreds of thousands of lives and billions of dollars every year, according to a new global health tool.

### [More women in dentistry workforce may lead to improvements in access](#)

The U.S. dental workforce is welcoming more women into its ranks, which could have implications for access to oral health care.

### [Racism can shape decisions to practice in underserved communities](#)

Racism in medical schools can influence whether graduating doctors choose to practice in high-need communities, a new study finds.

### [Healthy You: Get the skinny on protecting your skin](#)

Maintaining your skin is important throughout life. Check out these tips to keep your skin healthy. Read Healthy You online, or download as a PDF in English or Spanish.

# Emergency Management in the First State

Edward (Tony) Lee  
Principal Planner, Delaware Emergency Management Agency

## ABSTRACT

As a coastal state with low lying and flat geography, Delaware is vulnerable to coastal storms, floods, and various weather events impacted by the Northeast climate. These vulnerabilities encapsulate emergency management in Delaware as a complex process requiring efficient coordination and communications between government and communities. We must effectively provide resources and information statewide to ensure the safety of the public, preserve properties, and minimize the impact to restore normal activities.

## ALL HAZARDS, ONE RESPONSE

The task of emergency management in Delaware at the state level is led by Director A.J. Schall and his team of emergency management professionals at the Delaware Emergency Management Agency (DEMA). By state law, DEMA is the lead state agency for coordination of comprehensive emergency preparedness, training, response, recovery and mitigation services. This allows the agency to save lives, protect Delaware's economic base, and reduce the impact of emergencies. Accomplishing this mission requires establishing relationships and partnerships with communities, all levels of government, and (most importantly) the citizens of Delaware. These relationships allow DEMA to build resiliency through education, preparedness, and outreach.

DEMA works very closely with its federal counterpart, Federal Emergency Management Agency (FEMA) Region III, and the surrounding contiguous states (Maryland, Virginia, West Virginia, Pennsylvania, Washington D.C., and New Jersey) on emergency management planning and emergency/disaster operations. As FEMA Region III provides the conduit for state and federal planning and coordination, DEMA provides the state and local operational coordination with the Delaware National Guard and critical state, nonprofit, and nongovernmental agencies that coordinate emergency services within the State Emergency Operations Center.

DEMA also has a strong partnership with county and local emergency management entities, including the emergency managers of the three counties and the City of Wilmington. This core group provides an optimal emergency management team to address an "all hazards – one response" philosophy.

## FOCUS AREAS

DEMA planning encompasses three focus areas: natural hazards, technological hazards, and man-made hazards or terrorism. Each area is structured into a planning section within the agency; these areas of concentration collectively build into a holistic process of development of numerous emergency plans. It is critical in emergency management

to visualize and plan for events that impact the state through actual experience, disaster and weather modeling, review of events after-actions, partnerships with technical expertise, and university research processes.

The agency makes use of two major plans: the Delaware Emergency Operations Plan (DEOP) and the Delaware State All-Hazard Mitigation Plan (SHMP) to build the planning foundation for identification of hazards that threaten the state and the emergency operational procedures for the state's preparedness, support, and recovery for the hazards.

The DEOP incorporates hazards identified within the SHMP hazard identification process and operationalizes the threats into seven major categories:

1. **Natural Hazards** – Incidents/events that naturally occur by environmental conditions or which are derived from these conditions: flooding (coastal and riverine), hurricanes/tropical storms, earthquakes, winter storms, tornadoes, severe thunderstorms, and more.
2. **Technological Hazards** – Incidents/events that originate from technological or industrial accidents: cyber attack, hazardous material facility, radiological facility (nuclear power plant) and transportation-based hazardous material accident.
3. **Infrastructure Failures** – Incidents/events that result in failures in critical components of infrastructure that provide the fabric of daily life: communications failure, petroleum shortage, pipeline accident, power outage/failure, and structural failures.
4. **Public Health Emergencies** - Incidents/events involving naturally occurring or man-made pathogens that infect humans or systems used by humans: animal/plant/crop diseases, human health/pandemic emergency, and mass casualty accident.
5. **Terrorism** – Incidents/events that involve the unlawful use of force and violence against persons or property to intimidate or coerce a government,

the civilian population, or any segment thereof, in furtherance of political or social objectives: agricultural, biological, chemical, conventional, and radiological terrorism.

6. **Transportation Incidents** – Incidents/events involving the transportation infrastructure, including mass transit: air transportation, highway transportation, railway transportation, and waterway transportation incidents
7. **Social and Civil Emergencies** – Incidents/events derived from fire, breakdown in civil control, war, and other nominal emergencies: enemy attack, mass migration/repatriation, public disorder/civil unrest, school emergencies, and structure fires.

The DEOP's operational concept incorporates the "all hazards – one response" approach through addressing all elements of emergency support through the major categories. This plan is designed to formulate an integrated, multi-functional, multi-agency, multi-jurisdictional, and all-hazards flexible approach to incident management. DEMA activates emergency operations under a comprehensive program, which seeks to manage the totality of the emergency management process and to find ways to minimize the effects of disasters and emergencies on the state and its citizens. The plan reflects the intent to codify the process and

to integrate the state's emergency response system with that of local governments, other states, and the federal government. The state utilizes the National Incident Command System structure of emergency management and is consistent with the requirements of the National Incident Management System as this ensures continuity between levels of emergency management across the country.

## CONCLUSION

Disasters and emergencies occur at any time, with little or no warning in most cases. These events may impact small, discrete locations, or affect the entire geographic area of the state. The role of emergency management is to explore the threats and risks of each emergency and ensure levels of preparedness are established through education and information sharing, support is identified and provided through state resources, and recovery efforts are established and coordinated to return to the new normal after a disaster. Emergency management is a holistic team approach to address and survive disasters that impact Delaware. Know your role and be part of the solution, not the problem. More information can be found at the DEMA website: <http://www.dema.delaware.gov/>.

## REFERENCES

Delaware Code, Title 20, Chapter 31§3101-3130.



Image Source: Centers for Disease Control and Prevention



Image Source: Getty Images

## FOLLOW INSTRUCTIONS FROM EMERGENCY OFFICIALS

Always follow instructions from state emergency and local public safety officials before, during, and after emergencies. Most emergencies require Delawareans to stay put, also known as “shelter-in-place,” but other situations may call for residents to evacuate. If directed by public safety officials to shelter-in-place or evacuate, don’t delay: take immediate action and follow their instructions.



### ***Shelter-in-place***

- Remain inside your home or office;
- Close and lock all windows and exterior doors;
- Get out the household emergency supply kit;
- Turn on the radio or television, and listen to the news (local officials may be calling for the evacuation of individuals in certain areas at greatest risk);
- Go to an interior room without windows;
- In the case of a chemical threat:
  - Seek an above-ground location (some chemicals are heavier than air and may seep into basements even if the windows are closed);
  - Turn off all fans and heating and air conditioning systems;
  - Close the fireplace damper;
- Only seal off doors, windows, and vents if advised to do so by emergency management authorities. Listen to emergency broadcast information and carefully follow any instructions regarding sealing.

### ***Evacuation***

If the reason for the evacuation is a gas leak or a fire, immediately have everyone exit the home. From a safe location, call 9-1-1 and report the incident.

- Listen to the radio, monitor cell phones, and watch local news and weather channels;
- Heed all warnings and notification messages regarding when to leave and what routes to take;
- Wear sturdy shoes and layered clothing;
- Take the household emergency supply kit;
- Although emergency shelters may be able to provide some basic supplies, bring a blanket, pillow, air mattress, towel, washcloth, and any “specialty” supplies (i.e. diapers, food, and infant supplies);
- When evacuating with pets:
  - Make sure they are wearing collars and tags with your contact information on them,
  - Label leashes and/or have labeled carriers (owner’s and pet’s names);
  - Bring your pet’s food, water, and medications.
  - If going to a shelter, call ahead to make sure they accept pets or if heading for a friend or family member’s house, make sure they are aware you are also bringing your fur-babies. For more information, visit <https://www.redcross.org/get-help/how-to-prepare-for-emergencies/pet-disaster-preparedness.html>.
- Call your family’s emergency contact to tell him/her where the family is going and the expected arrival time;
- If directed by public safety officials, shut off water and electricity before leaving. Leave natural gas service ON unless public safety officials direct otherwise.
- Lock the home.
- Use travel routes specified by local authorities. Do not use shortcuts, as certain areas may be impassable or dangerous.
- Stay away from downed power lines.

# DHSS Press Release

Dr. Kara Odom Walker, Secretary  
Jill Fredel, Director of Communications  
302-255-9047, Pager 302-357-7498  
Email: [jill.fredel@delaware.gov](mailto:jill.fredel@delaware.gov)

October 18, 2019  
DHSS-10-2019

DPH Media Contact:  
Jennifer Brestel  
302-744-4907, Cell 302-612-6223  
Email: [Jennifer.brestel@delaware.gov](mailto:Jennifer.brestel@delaware.gov)

## KEEP CHILDREN SAFE ON HALLOWEEN

**DOVER (Oct. 18, 2019)** – Halloween is one of the most dangerous days of the year for pedestrians, according to Safe Kids Worldwide. Children are more than twice as likely to be hit by a car and killed on Halloween than on any other day of the year. In Delaware, 23 pedestrians of all ages have died through Oct. 14 of this year, up more than 40 percent over the same point last year, according to the Delaware Office of Highway Safety.

The Safe Kids Delaware Coalition reminds parents to take precautions to keep their children safe while trick-or-treating:

- Cross the street at corners and use crosswalks. Obey traffic signals and make sure vehicles are stopping before crossing.
- Look left, right, and left again when crossing. Keep looking as you cross.
- Put electronic devices down and keep heads up. Walk (do not run) across the street.
- Teach children to make eye contact with drivers before crossing in front of them.
- Always walk on sidewalks or paths. If there are no sidewalks, walk facing traffic as far to the left as possible. Children should walk on direct routes with the fewest street crossings.
- Watch for cars that are turning or backing up. Teach children to never dart out into the street or cross between parked cars.

### ***Trick or Treat with an Adult***

Children under the age of 12 should not be alone at night without adult supervision. If kids are mature enough to be out without supervision, remind them to stick to familiar, well-lit areas and to trick-or-treat in groups. While some cities and municipalities may set specific hours for trick or treating, Delaware does not have uniform trick or treat hours.

### ***Keep Costumes Creative and Safe***

- Decorate costumes and bags with reflective tape or stickers and, if possible, choose light colors.
- Choose face paint and makeup whenever possible instead of masks, which can obstruct a child's vision.
- Have kids carry glow sticks or flashlights to help them see and be seen by drivers.
- When selecting a costume, make sure it is the right size to prevent trips and falls.

The Safe Kids Delaware Coalition, an affiliate of SAFE KIDS Worldwide®, is a nonprofit organization established in 1989, comprised of volunteers dedicated to reducing unintentional childhood injury in children from birth to age 14. The Delaware Division of Public Health (DPH) serves as the lead agency for Safe Kids Delaware.

For more safety tips on topics for children, visit <https://www.safekids.org/>. For more information about Safe Kids Delaware, visit: <https://www.dhss.delaware.gov/dph/ems/safekids.html>.

*A person who is deaf, hard-of-hearing, deaf-blind or speech-disabled can call the DPH phone number above by using TTY services. Dial 7-1-1 or 800-232-5460 to type your conversation to a relay operator, who reads your conversation to a hearing person at DPH. The relay operator types the hearing person's spoken words back to the TTY user. To learn more about TTY availability in Delaware, visit <http://delawarerelay.com>.*

*The Delaware Department of Health and Social Services is committed to improving the quality of the lives of Delaware's citizens by promoting health and well-being, fostering self-sufficiency, and protecting vulnerable populations. DPH, a division of DHSS, urges Delawareans to make healthier choices with the 5-2-1 Almost None campaign: eat 5 or more fruits and vegetables each day, have no more than 2 hours of recreational screen time each day (includes TV, computer, gaming), get 1 or more hours of physical activity each day, and drink almost no sugary beverages.*

# The American Red Cross' Disaster Protocol— The Delaware Chapter

Israa Hassan

Communication Specialist; Red Cross volunteer

## ABSTRACT

Each day, thousands of people are affected by natural and man-made disasters. As one of the most recognized humanitarian organizations in the United States, the American Red Cross (ARC) provides emergency assistance, disaster relief, and disaster preparedness education wherever it is needed.

With the support of volunteers, donors and employees, the ARC actively works on preparedness, response, and recovery of disasters through its array of programs and initiatives.

It is important to recognize that the ARC is not only present during and after disasters, but even before disaster strikes.

The ARC prides itself on pro-actively intervening to help communities be “Red Cross Ready.” ‘Red Cross Ready’ is a phrase known within and outside of the organization that refers to making a plan, building a disaster kit, and being informed about potential threats.

“We urge communities to have those types of [emergency preparedness] conversations with family and loved ones before a situation arises,” said Delmarva Red Cross Executive Director Theresa Young. “It means talking about having a meeting spot, talking about transportation, and making sure everyone has an emergency kit on hand. We want everyone to have that plan set, so when necessary, action can be taken swiftly and without the extra burden of making split-second logistical decisions.”

Being prepared before a crisis occurs can make all the difference in reducing endangerment and distress. It is essential to have an idea of which type of emergencies occur where you live, what preparedness steps you can take, what to do during an emergency, and how to repair and rebuild afterwards. ‘Red Cross Ready’ does not only apply for the person leading the household. The ‘Red Cross Ready’ website: <https://redcross.org/get-help/how-to-prepare-for-emergencies.html> provides disaster safety tips, preparedness guides and safety checklist for children, people with disabilities, seniors, and even your fluffy companions.

One of the best examples of this preparedness principle is the Red Cross’ *Sound the Alarm* initiative ([Soundthealarm.org](http://Soundthealarm.org)), part of its continuing Home Fire Campaign. The cost-free effort was launched in 2014 to reduce the risk to serious injuries and deaths due to house fires.

According to ARC Delmarva Chapter Disaster Program Manager Sharon Jefferson-Hawkins, house fire statistics over a five-year period were evaluated in the chapter’s high-risk areas: spots with high density populations and low socioeconomic status. The chapter developed partnerships with neighborhoods in those areas to establish rapport with residents and eventually, for ARC volunteers and community stakeholders to schedule household visits to test and install missing or malfunctioning smoke alarms. Then trained volunteers sit down with the residents and review how to create a fire escape plan for their

home or wider community. Volunteers also go over management plans for disasters common to the area.

Sound the Alarm practices can potentially reduce the risk of house fire deaths in half. The initiative has directly led to 627 lives saved, the installation of more than 1.8 million free smoke alarms, and more than 783,000 homes made safer across more than 16,000 U.S. cities and towns. As is the case in Wilmington, Delaware, local fire departments join in the effort and bolster Sound the Alarm events.

## RESPONDING TO DISASTERS

Even with safety measures, disasters are inevitable. That is why the ARC plays a vital role in communities. The ARC holds a charter from the U.S. Congress that mandates response to disasters when called upon. Although not first responders, ARC volunteers and staff often render aid in the wake of hurricanes, tornadoes, flooding, or home fires, the most common disaster that prompts a Red Cross response. Local emergency managers and public safety officials determine the areas in which the ARC becomes involved.

“This planning is conducted through ongoing communication with city officials to ensure resource alignment,” Young said. “I have three states in my chapter: Virginia, Maryland, and Delaware. Each state has a different agreement with the American Red Cross to determine what type of support we can provide to that state’s emergency management officials.”

In the case of a major natural disaster, the ARC uses a 120-hour timeline – depending on the disaster’s epicenter – to start implementing a plan to determine where to stage materials, set up an evacuation or long-term shelter, handle meals and support basic life-sustaining needs. If the disaster shifts, the ARC shifts its plans. The ARC mobilizes volunteers and workers from across the country to help areas hit hardest by a disaster. From hurricanes, to flooding, devastating wildfires and home fires, with the support of donors, partners and volunteers, the ARC responds to an emergency every eight minutes somewhere in the country.

## THE ROLE OF VOLUNTEERS IN THE DISASTER RESPONSE

As a volunteer lead organization, the ARC is able to provide its services through the generosity of their donors and the resourcefulness of volunteers. Ninety percent of what the ARC does is driven by the work and passion of volunteers.

A person may volunteer a moment, a day or a week of their valuable time for a disaster. During that period, the volunteer determines where their specialty may lie, and how they will be able to support during the disaster.

The ARC provides specific, structured trainings for volunteers before and during a disaster. Volunteers receive basic training and are certified in first aid, cardiopulmonary resuscitation, and in the use of automated external defibrillators (AEDs). They also receive training specific to their role, such as how to run an emergency shelter, drive an emergency response vehicle, provide mass care, safely feed people, and manage supply logistics. Leadership training and communication courses are offered through external partners.



**Ed and Teddy – Delmarva Red Crosser**  
Ed Scarborough with his travel companion Teddy, who he uses to soothe youngsters during disasters.  
Learn more about Ed: <https://www.redcross.org/local/maryland-delaware/about-us/news-and-events/news/mega-volunteer-s-travels-bring-help--hope-to-all-he-reaches--.html>.

Courtesy American Red Cross – Greater Chesapeake Region

## RECOVERING FROM A DISASTER

Red Cross volunteers can also play a significant role in mental health support following a traumatic experience.

“Imagine your home has been lost in a fire and you are standing off the street with your children who want to know where they will stay,” Young said. “We have Disaster Mental Health support there to not only help you with that moment and that conversation, but to also be there to help you rebuild your new normal.”

“Disaster Mental Health helps the person navigate all the things going through their mind to get them to ‘what do I need to do next?’ And that is a very essential aspect of recovery,” Young said. “In case of a disaster, we have people evacuating their home. When they arrive to a shelter, it is important that they have someone to talk to and address their emotional needs before they can start managing their next path of recovery. Having people there to just be a listening ear and to help understand what they are going through and then pinpoint a path for the next step is very important.”

Another part the ARC plays in disaster recovery is reunification. If family members are separated during a disaster, the ARC provides services to reconnect family members. In addition, the ARC attempts to close the recovery gap by providing an impacted individual or family with as many humanitarian services and resources as possible, reduce their financial burden if necessary and help them move forward into their new normal. Sometimes recovery is not always in a way that’s requested but is needed at the moment.

## TECHNOLOGY: A TURNING POINT IN DISASTER RESPONSE

The ARC has upgraded its use of technology in preparing, responding, and managing disasters. One of its most powerful applications is the disaster response and management tool called “Red Cross View (RC View).” This mobile application has incredible usefulness and scope for planning and delivery of services.

RC View enables the ARC and partners to share a visual situational awareness with near real-time data to better manage disaster operations. RC View is used to map out homes impacted by a disaster, note damage assessments conducted, help with risk analysis, and tally services delivered. It also provides the ARC with resources information, such as where emergency response vehicles are located, where meal distribution is taking place, and what communities require support. RC View integrates with local and national databases.

The organization has also invested in the development of multiple mobile disaster applications with expert information that anyone can download. The apps are found in app stores corresponding to one’s smartphone and are displayed on the ARC website.

One of the most commonly used ARC apps is the Blood Donor App, a mobile app featuring nearby ARC blood drives, appointment scheduling, blood donation journeys, and geo-targeted blood shortage alerts. Another ARC app is the Emergency: Alerts App, which allows users to learn the presence of disasters, locate the closest open shelters, activate a flashlight or strobe light, and take quizzes on the recommended action steps for 35 types of emergencies. The Emergency: Alerts App monitors conditions wherever the device is located and provides instructions about what to do before, during and after a storm, even if the user has no data connectivity. Storm alerts provide the opportunity for users to prepare their families and homes, to find help, and to let others know they are safe.

“These apps were specifically designed to help keep families safe during severe weather and emergencies,” Jefferson-Hawkins said.

To make it easier for people to get critical safety information and access its services, the ARC expanded its reach with voice technology through Alexa, Amazon’s voice service. By using Alexa-enabled devices, such as Amazon Echo, Echo Dot, Echo Show or Echo Spot, users can enable skills for Alexa to get valuable first aid information, schedule a blood donation, receive notifications about approaching severe weather or make a donation. People can test their first aid knowledge and play the first aid quizzes at “Red Cross Skills for Alexa;” visit <https://www.redcross.org/get-help/how-to-prepare-for-emergencies/mobile-apps/alexa-skills.html>.

The ARC is funded primarily through private donations of American citizens, board member contributions and corporate partners who provide financial and in-kind services. For more information about the Delmarva Chapter of the American Red Cross, visit [www.redcross.org/local/maryland-delaware](https://www.redcross.org/local/maryland-delaware) and read its annual report, or call 302-656-6620. Register for trainings like CPR/AED, first aid and other safety courses at [www.redcross.org/take-a-class](https://www.redcross.org/take-a-class).

# Volunteers: The Core of the American Red Cross Response, Preparedness

Autumn Thompson  
American Red Cross volunteer

## ABSTRACT

American Red Cross (ARC) volunteers and donors fulfill our mission of preventing and alleviating suffering from emergency situations and inspire those around the country and world to take part in giving back.

ARC administers several different programs within the emergency preparedness arena and prioritizes education. Whether helping families consider the functional needs during an evacuation, such as pet care, or training communities in CPR and first aid, ARC educates communities to be prepared and unafraid in the event of a disaster.

Volunteers are critical in assisting with disaster preparedness efforts. Ninety percent of the ARC's work is completed by roughly 300,000 U.S. volunteers who respond to more than 64,000 incidents annually.

"The mission of our organization is to help people in their time of need through leveraging our volunteer resources," said ARC Delmarva Chapter Executive Director Theresa Young. "We are truly a volunteer lead organization, as our volunteers provide such valuable perspectives on how to best break through to communities in need."

## WHO DAT?

Red Cross Disaster Action Teams (DAT) are teams of volunteers that respond to an emergency call within two hours. Emergency calls will come in from community partners, such as local fire departments, and occasionally from individual community members.

DAT crews are ARC's public face in the community and make a difference to survivors of various emergencies during their most critical times. These crews may include volunteers who focus on mental health and trauma awareness, provide immediate basic assistance, and identify safe housing environments for displaced community members.

Some volunteers are trained mental health nurses and counselors who use their licenses and skills to help with the immediate effects of trauma caused by emergencies like house fires or a mass shooting. These volunteers visit shelters and canvas communities following major disasters to determine how survivors are coping, and they provide crisis-based mental health intervention if necessary. If a survivor needs long-term services, ARC nurses can often provide referrals to community resources.

## RECRUITMENT

When recruiting disaster preparedness volunteers, effective listening skills, sympathy and empathy, and determination are desired qualities. Volunteers must be dedicated to helping others in their time of need. They must be able to look at the whole scene, assess the immediate situation, and determine how to best help a person in that moment.

"Having the ability to listen and think critically helps Red Cross volunteers be able to provide much needed compassion that lets survivors know that we are here to help them get back on the road to recovery," Young explained.

## TRAINING

A general monthly time commitment is required for most volunteers. The level of training and opportunities to progress in skill sets are plentiful and fully up to the volunteer. ARC volunteer trainings are uniform and specific to the type of work they wish to assist in and to their age range. For example, a volunteer with an early childhood education background may be trained in the Pillowcase or PEDRO Projects, which are elementary emergency preparedness programs that urge children to make household emergency kits and have preparedness conversations with their families. Younger volunteers may want to become blood ambassadors at blood drives, or take lifeguarding or babysitter certification courses.

The ARC teaches volunteers how to provide life-saving aid by only providing chest compressions; and basic first aid for cuts, burns, and head, neck, and other traumatic injuries. Volunteers also learn how to effectively manage dynamic personalities and emotions during an emergency.

ARC is always in need of volunteers. To learn how to become an ARC volunteer, visit: <https://rdcrss.org/2Rgm6xq> or e-mail: [gcrvolunteerservices@redcross.org](mailto:gcrvolunteerservices@redcross.org). To review the wide array of ARC trainings, visit [www.redcross.org](http://www.redcross.org).



## VOLUNTEERS NEEDED!

In times of trouble, families and communities rely on each other more than ever. Delaware's volunteer organizations often rally to support those in need, from one household to entire communities. Consider signing up to be a volunteer for one of these four groups:

### *Delaware Medical Reserve Corps*

The Delaware Medical Reserve Corps (DMRC) is a volunteer corps comprised of dedicated medical and non-medical professionals who give their time and expertise to prepare for, and respond to, public health emergencies. Volunteers also participate in health promotion and education in local communities.



Because many health care workers will already be committed to a role during an emergency, there is a need to recruit both medical and non-medical personnel who can assist as volunteers during emergency responses. DMRC volunteers deliver a variety of public health services during a crisis, including care and support directly to individuals at shelters. Examples include mass vaccinations, medication dispensing, evacuee triage, administrative support, language translation, safety and traffic control at events, medical personnel assistance, supply distribution, logistics, community outreach education, and behavioral and emotional support.

The Delaware Department of Health and Social Services (DHSS), Division of Public Health sponsors the DMRC. There are three county units. For more information or to register as a DMRC member, visit <https://sites.udel.edu/delawaremrc/>.

### *Delaware Citizen Corps*

The Delaware Citizen Corps (DCC) Program at the



Delaware Emergency Management Agency actively encourages everyday citizens to embrace the role they play in keeping our communities stronger, safer, and better prepared. The goal is to inspire people to "Be the help until help arrives" by providing information, training, and active engagement with their respective communities. DCC works towards this goal through community outreach, citizen emergency response training, and support of partners, in promotion of hazard awareness and emergency preparedness. The overarching theme for all outreach efforts is: "Make a Plan, Make a Kit, and Stay Informed."

Community Emergency Response Team (CERT) Training is a great way to better prepare yourselves and your community. CERT is a nationally recognized program based a "Neighbor-Helping-Neighbor" approach that was started by the Los Angeles Fire Department in 1986. CERT training is designed to prepare you to help yourself, your family, and your neighbors in the event of a catastrophic disaster. Because emergency services personnel will not be able to help everyone immediately, you can make a difference by using the training you receive to save lives

and protect property. The training covers basic skills that are important to know in a disaster when emergency services are not available in order to do the greatest good for the greatest number after a disaster, while protecting yourself from becoming a victim. For more information about CERT and upcoming classes, visit our county partners New Castle County Emergency Management (<https://nccde.org/158/Community-Emergency-Response-Team>) and the PrepareDE.org Facebook page ([www.Facebook.com/PrepareDE](http://www.Facebook.com/PrepareDE)). For more information, email DCC at [DECitizenCorps@Delaware.gov](mailto:DECitizenCorps@Delaware.gov) or call at 302-659-3362.

### *State Office of Volunteerism*

The State Office of Volunteerism (SOV) is Delaware's primary resource for volunteerism and national service.

Administered by the DHSS, Division of State Service Centers (DSSC), the SOV promotes and encourages volunteerism among persons of all ages and provides coordination and linkages with volunteer programs throughout the state. In times of disaster, the SOV is tasked with establishing and operating a Volunteer Reception Center (VRC) to manage unaffiliated and spontaneous volunteers. The VRC serves as a central place where large numbers of spontaneous volunteers are interviewed, registered, and processed in terms of skill level data and information. Assignments and referrals are made to responding agencies in need of their service.

To learn more about the SOV's role during disaster, visit its website at <https://volunteer.delaware.gov/> or call Faith Mwaura, Social Services Senior Administrator, DSSC, Director's Office at 302-255-9691.



### *American Red Cross - Delmarva Chapter*

The American Red Cross helps people prepare for, respond to, and recover from disasters. The Red Cross provides disaster response (most often for home fires), support for military members and their families, life-saving training courses, the collection and distribution of much-needed blood and blood products, support for international issues, and much more. The Delmarva Chapter covers the state of Delaware; Accomack County and Northampton County in Virginia; and these Maryland counties: Caroline, Cecil, Dorchester, Kent County, Queen Anne's, Somerset, Talbot, Wicomico, and Worcester. To become an ARC volunteer, visit: <https://rdcrss.org/2Rgm6xq> or e-mail: [gcrvolunteerservices@redcross.org](mailto:gcrvolunteerservices@redcross.org).



**American Red Cross**

### *Volunteer Organizations Active in Disasters*

Non-profit organizations interested in assisting during a disaster here in Delaware can contact the Delaware Volunteer Organizations Active in Disasters at [https://devoid.org/communityos.org/cms/contact\\_de](https://devoid.org/communityos.org/cms/contact_de). To donate or volunteer throughout the U.S. and its territories as an organization or an individual, visit the National Volunteer Organizations Active in Disasters website at <https://www.nvoad.org/howtohelp/>.



# Delaware Medical Reserve Corps (DMRC)

Lisandra Clarke, B.S.

State Volunteer Coordinator, Office of Emergency Management and Preparedness Section, Division of Public Health

## ABSTRACT

The Medical Reserve Corps (MRC) is a national network of volunteers, organized locally to improve the health and safety of their communities. The MRC network comprises of approximately 180,000 volunteers in roughly 860 community-based units located throughout the United States and its territories, including here in Delaware. MRC volunteers include medical and public health professionals, as well as other community members without health care backgrounds. MRC units nationwide engage these volunteers to strengthen public health, improve emergency response capabilities, and build community resiliency. They prepare for and respond to natural disasters, such as wildfires, hurricanes, tornadoes, blizzards, and floods, as well as other emergencies affecting public health, such as disease outbreaks. They also frequently contribute to community health activities that promote healthy habits.

## MEDICAL RESERVE CORPS (MRC) HISTORY

The national MRC movement began after September 11, 2001 (9/11) when there was difficulty managing the thousands of spontaneous volunteers, as Americans across the country were eager to help. The approach to organize these volunteers was developed in the months following the event and the MRC concept now exists to pre-identify, pre-train, and pre-credential volunteers for national emergencies and public health special events.

The national MRC program partners with the U.S. Department of Homeland Security's Citizen Corp and is headquartered in the Office of the Assistant Secretary for Preparedness and Response at the U.S. Department of Health and Human Services (DHHS). Coordination of the MRC program exists at the national, regional, state, and local levels:

1. National Level: Division of the Civilian Volunteer Medical Reserve Corps (DCVMRC) headquartered in the Office of the Assistant Secretary for Preparedness and Response within DHHS
2. Regional Level: 10 designated MRC Regions, containing any number of local MRC units, led by 10 Regional MRC Coordinators
3. State Level: State MRC Coordinators
4. Local Level: Local MRC Unit Coordinators

## DELAWARE MEDICAL RESERVE CORPS

The Delaware Medical Reserve Corps (DMRC) started in 2006 and its network is a community-based, civilian, volunteer program that helps build the public health infrastructure and response capabilities of Delaware communities. The DMRC's mission statement is: "To serve the State of Delaware by establishing, implementing, and sustaining Delaware's reserve units of medical and non-medical volunteers to strengthen the public health infrastructure, improve emergency preparedness response, and increase community resilience in Delaware."

The DMRC is housed in the Delaware Department of Health and Social Services, Division of Public Health (DPH), Emergency Medical Services and Preparedness Section; and is funded in partnership with the University of Delaware's School of Nursing.

The DMRC has three county units (New Castle, Kent, and Sussex counties) that were created in 2013 to provide added structure.

## BENEFITS OF VOLUNTEERING

- Free specialized disaster and emergency trainings and continued education credits.
- Experience in disaster management and public health emergencies.
- Assist the medical professional community and community-at-large to be prepared/respond.
- Establish emergency shelters and emergency care.
- Develop a disaster response workforce.
- Support public health with community preparedness and response through professional and community events, health fairs, faith-based events, and business events.

## WHO SHOULD VOLUNTEER?

Membership is open to anyone over 18 years of age who is interested in promoting public health and assisting in the event of an emergency. Whether you are an actively licensed health care professional, student, retired health professional, or someone with an interest in volunteering during emergencies, you are encouraged to register with the DRMC. Because many health care workers will already be committed to a role during an emergency, there is a need to recruit both medical and non-medical personnel who can assist as volunteers during emergency responses. The DMRC is actively recruiting medical and non-medical volunteers, including, but not limited to: administrative and information technology specialists; office support staff; greeters or runners; patient transporters; chaplains; radio operators; interpreters; social workers; mental health practitioners; EMTs or paramedics; physicians; nurses; respiratory therapists; pharmacists; dentists; and epidemiologists.

## WHAT DO DMRC VOLUNTEERS DO?

There are many roles a reserve corps volunteer can play to support everyday public health initiatives, as well as during emergency and disaster events. Volunteers may also serve a vital role by assisting their communities with ongoing public health needs.

Volunteers deliver a variety of public health services during a crisis, including care and support directly to individuals at shelters. Examples include mass vaccinations, medication dispensing, evacuee triage, administrative support, language translation, safety and traffic control at events, medical personnel assistance, supply distribution, logistics, community outreach education, and behavioral and emotional support.

## TRAININGS

The DMRC seeks to provide volunteers with knowledge and skills in disaster preparedness and emergency response by aligning with the national MRC training plan. In-class trainings are announced as they become available. Registered DMRC volunteers receive training announcements by checking the calendar on the DMRC website as well as via email.

All DMRC responders, regardless of professional background, must complete the DMRC orientation to the program and certain other required trainings such as: Shelter 101/201, Shelter Tech training, Stop the Bleed, CPR/AED, and Flu Clinic training. Additional trainings are available on our website, and all trainings are provided free of cost.

## HOW CAN YOU REGISTER?

Volunteering with the DMRC is a great way to develop and improve skills while gaining valuable hands-on experience in emergency management and preparedness. If you would like more information about becoming a member of the DMRC, register online at <https://sites.udel.edu/delawaremrc/>. This website provides DMRC volunteers with countless informative materials such as a calendar filled with training and exercise dates. It also includes information on these and other community programs:

- The Naloxone Community Training and Distribution Assistance Program allows volunteers to attend trainings so that they can train community members to identify a possible opioid overdose and utilize naloxone effectively. DMRC volunteers assist DPH with dispensing naloxone to community members and providing on-the-spot training.

- Stop the Bleed trainings are intended to cultivate grassroots efforts that encourage bystanders to become trained, equipped, and empowered to help in a bleeding emergency before professional help arrives.

If you become involved with DMRC, you will receive an alert in the event of a disaster and have the opportunity to either accept or decline the volunteer request. If you accept, specific instructions will be provided regarding where and when to report, and what is needed for the incident. There is no obligation to participate during activation. Make a difference in your community and join the DMRC today!

## FOR MORE INFORMATION:

For more information concerning the DMRC program or DPH's emergency preparedness initiatives, contact Trina Cale-Rosario, Training Administrator, Office of Preparedness, at 302-223-1720 or [trina.cale-rosario@delaware.gov](mailto:trina.cale-rosario@delaware.gov) or visit these websites:

Delaware Medical Reserve Corps website,  
<https://sites.udel.edu/delawaremrc/>

National Medical Reserve Corps website,  
<https://mrc.hhs.gov/homepage>



Beth Mills of the Sussex Delaware Medical Reserve Corps demonstrates how to administer naloxone at a Community Naloxone Distribution Event in March 2019. The Division of Public Health sponsored the event at Delaware Technical Community College, Owens Campus in Georgetown. Photo by Donna Sharp.

# The DPH Bulletin

From the Delaware Division of Public Health

September 2019

## DHSS drug overdose mortality data identifies interaction opportunities

For the first time, the Delaware Department of Health and Social Services (DHSS), Division of Public Health (DPH) has developed a demographic picture of Delawareans who died from drug overdoses. Its new report, [Drug Overdose Mortality Surveillance, Delaware, 2017](#) provides an in-depth look of the individuals who died of drug overdoses in Delaware in 2017 and the types of drugs they used. The report, which came about through the integration of 12 multi-agency datasets, also contains drug overdose mortality trends.

DHSS believes the data within this report will help identify and maximize key touch points for connecting Delawareans with substance use disorder to treatment services. For example, the report includes if, how, and when the decedents interacted with Delaware's health systems, including Emergency Departments, Emergency Medical Services, the Prescription Drug Monitoring Program, the DHSS Division of Substance Abuse and Mental Health contractors; and hospital discharges. An expanded analysis includes data on Department of Correction interactions and Medicaid eligibility and claims.

One important result of the data analysis was the identification of top occupational industries of those who died of drug overdoses. Among males, the top

two industries were construction (36 percent) and the install, maintain, and repair industry (9.1 percent, which includes mechanics, HVAC repair, engine repair,

maintenance, and other occupations). The top two occupational industries among females were food service (14.7 percent) and office support (12.8 percent); however, 33 percent were not employed. As a result of this report, DHSS is already working on outreach plans to reach individuals in these identified occupations.

View the report on DPH's website at [https://www.dhss.delaware.gov/dhss/dph/files/dedru\\_goverdosemortsurvrpt2017.pdf](https://www.dhss.delaware.gov/dhss/dph/files/dedru_goverdosemortsurvrpt2017.pdf).



DELAWARE HEALTH AND SOCIAL SERVICES  
Division of Public Health



## Breastfeeding resources

The Women, Infant, and Children (WIC) World Breastfeeding Event, sponsored by the Division of Public Health's WIC Program, was held Aug. 1 in Dover. At left, DeSheena McCray of Georgetown holds her 11-month-old daughter, Shanell McCray. Below, representing Christiana Care Health Systems' Offices of Community Health and Health Equity are, from left: Adriana Viveros, Breanna Thomas, Delsy Morales, and Carla Aponte Johnson. Photos by Donna Sharp.



## Volunteers needed to help DPH evaluate its emergency response

DPH's Office of Preparedness seeks volunteers to participate in a public health preparedness exercise on September 28, 2019. The 2019 Delaware Medical Countermeasures Distribution/Dispensing Exercise will help the agency evaluate its response capability in the event of a public health emergency.

The exercise will be held at two Delaware Technical Community College sites: the Stanton campus, A-Wing, Main Entrance, 400 Stanton Christiana Road, Newark, DE 19713; and the Terry campus, Education and Technology Building, Del-One Conference Center, 100 Campus Dr., Dover, DE 19904.

Registered volunteers will simulate Delawareans who receive dispensed medication. They will complete forms and process through a line at least five times. Registered volunteers will receive a free lunch.

To register as a volunteer, visit <https://conta.cc/2STTHz1> and register for one or more of these time slots: 10:00 a.m. to 11:00 a.m., noon to 1:00 p.m., and 1:00 p.m. to 2:00 p.m. The entire exercise runs from 10:00 a.m. to 3:30 p.m. For more information, call DPH at 302-223-1720.

In addition to this exercise, DPH is participating in a regional emergency preparedness drill in October.

**Registration and housing for #APHA2019 are open!**  
**Register now and join us Nov. 2–6, in Philadelphia to learn and network.**  
[www.apha.org/meeting-registration](http://www.apha.org/meeting-registration)



APHA's 2019 Annual Meeting and Expo takes place Nov. 2–6, in Philadelphia and will bring together nearly 13,000 public health professionals from around the world. APHA 2019 will be filled with engaging sessions, including those that align with the meeting's theme, "Creating the Healthiest Nation: For science. For action. For health." Attendees will learn the latest in research and practice, hear from inspirational keynote speakers, network with their peers, and build skills to advance in their careers. Register now and join us for this celebration of public health. Learn more about APHA 2019 at [www.apha.org/annualmeeting](http://www.apha.org/annualmeeting).

# Debunking 10 Disaster and Preparedness Myths

Molley Dworkin

Environmental Scientist, Division of Public Health, Office of Preparedness

## ABSTRACT

Personal preparedness can improve resiliency during and after disasters when not hindered by persistent disaster and preparedness myths. Knowing the facts behind disaster preparedness and response and available resources to build resiliency can help communities survive and recover.

### MYTH 1:

#### ONLY CERTAIN NATURAL HAZARDS COULD AFFECT DELAWARE.

While flooding, nor'easters, and hurricanes are Delaware's most prevalent natural hazards, there are other less frequent natural hazards and possible man-made disasters. These include industrial accidents involving chemical facilities and power plants, terrorism, and transportation accidents in the aviation, highway, marine, pipeline, and railroad infrastructure. Since 1954, Delaware on average has experienced a tornado once per year and earthquakes have occurred off our coast. The Delaware Emergency Management Agency (DEMA) developed a family preparedness resource for coastal storms, but it can be useful in many other situations ([http://www.dema.delaware.gov/information/nat\\_haz.shtml](http://www.dema.delaware.gov/information/nat_haz.shtml)). Being aware of what is around your home can help you prepare your disaster kit. DEMA developed an all-hazard mitigation plan for the state ([http://www.dema.delaware.gov/usr/pdf/DE%20All-Haz%20Mit%20Plan\\_Aug%202018.pdf](http://www.dema.delaware.gov/usr/pdf/DE%20All-Haz%20Mit%20Plan_Aug%202018.pdf)).

### MYTH 2:

#### CALLING 911 AND WAITING FOR AID IS THE BEST/ONLY OPTION POST-DISASTER.

Individuals should be able to provide for themselves in the first several hours, or up to three days, post-disaster. Help may take a while to arrive, as many people will be in need of assistance. By having basic emergency supply kits and go bags, individuals are prepared to shelter in place or evacuate their homes. A household emergency supply kit should include enough food, water, and supplies per person for three days. To create a basic household emergency supply kit, visit <https://www.prepared.org/make-a-kit/>.

To become involved in community disaster response, individuals can attend Community Emergency Response Team (CERT) training. While not a replacement for first responders, CERT-trained citizens can aid their families and communities during disasters. To learn more about CERT in Delaware, visit <https://nccde.org/158/Community-Emergency-Response-Team>.

### MYTH 3:

#### INDIVIDUALS ONLY NEED TO WORRY ABOUT THEMSELVES DURING A DISASTER.

Many people besides oneself need to be considered in a disaster. Other household members, pets/service animals, neighbors, and family living outside of your neighborhood may be impacted. Vulnerable populations, including the elderly and those with medical conditions and disabilities, are disproportionately and negatively affected by disasters.<sup>1</sup> The poor, the illiterate, those who do not speak English as their first language, and those who are isolated culturally, geographically, or socially are other examples of vulnerable populations.<sup>2</sup>

### MYTH 4:

#### HOMEOWNER'S AND RENTER'S INSURANCE COVER FLOOD DAMAGE.

Flood insurance is typically a separate coverage than homeowner's or renter's insurance. As flooding is the most prevalent disaster, comprising 40 percent of natural disasters globally, extra precautions should be taken to protect homes and possessions.<sup>3</sup> To determine if a home is within the Federal Emergency Management Agency's (FEMA) 100-year floodplain, use the interactive map developed by the Delaware Department of Natural Resources and Environmental Control (<https://maps.dnrec.delaware.gov/FloodPlanning/default.html>). Flood insurance can be purchased through insurance agents participating in the National Flood Insurance Program (NFIP). For more information on the NFIP, visit: <https://www.fema.gov/national-flood-insurance-program>.

### MYTH 5:

#### FLOODING ONLY OCCURS IN COASTAL AREAS.

While Delaware is a coastal state and flooding is one of the state's top disaster issues, flooding occurs frequently outside of coastal areas. The Northeast and Midwest have experienced the greatest increase in occurrence of heavy precipitation events since 1950.<sup>4</sup> The Midwest is composed of landlocked states, which have experienced historic flooding in 2019. This demonstrates that flooding can occur far away from coastlines. Flash flooding can be caused by heavy rainfall, as well as debris flow (i.e. mudslides) and dam/levee breaks. Streams, creeks, streets, and highways can be the location of flash flooding events.<sup>5</sup>

The National Weather Service (NWS) found that weather-related fatalities were highest during excessive heat, followed by flood events (<https://www.weather.gov/hazstat/>). To view current flooding across the United States, visit the United States Geological Survey web page ([https://waterwatch.usgs.gov/?id=ww\\_flood](https://waterwatch.usgs.gov/?id=ww_flood)) and the NWS web page ([https://www.weather.gov/crh/historic\\_flooding\\_2019](https://www.weather.gov/crh/historic_flooding_2019)).

### MYTH 6:

#### DISASTERS CAUSE EPIDEMICS.

The claim that disasters cause epidemics is not supported by evidence; however, instances of illness may increase due to crowded shelters or disease, such as cholera, resulting from limited safe water availability.<sup>6</sup> Complex emergencies are humanitarian crises which include violence, political instability, poverty, and/or social injustices<sup>7</sup> and are associated with the spread of vaccine-preventable diseases, as compared to natural disasters. Acquiring up-to-date vaccinations is a great way to protect yourself.<sup>8</sup> Deceased individuals do not pose a greater risk for spreading most infectious diseases, although in certain cases, remains can spread diseases such as avian and pandemic influenza and Ebola Hemorrhagic Fever.<sup>3</sup>

## **MYTH 7:** FIRST AID AND PRESERVATION OF PROPERTY ARE THE ONLY CONCERNs DURING DISASTER.

It is important to address the mental health status of disaster victims and the first responders who come to their aid. While most people who experience a disaster are resilient, some can develop mental illness and children who experience disasters are especially vulnerable.<sup>8</sup> Individuals with pre-existing serious mental illnesses are more at risk for being less prepared for disasters. A study that examined the mental health of survivors of 10 different disasters concluded that 14 percent of survivors developed major depression post-disaster and 20 percent suffered from disaster-related post-traumatic stress disorder.<sup>9</sup> Furthermore, evidence suggests that the type of disaster can have a drastic effect on mental health. Mass violence events and human-made technological disasters have even more of a negative effect on mental health than natural disasters.<sup>8</sup> To connect with crisis intervention services, contact the Delaware Division of Substance Abuse and Mental Health by calling 800-652-2929 in northern Delaware and 800-345-6785 in southern Delaware.

## **MYTH 8:** ONLY ONE DISASTER WILL OCCUR AT A TIME.

Multiple disasters can occur simultaneously. Think of a fire that causes an explosion, or a train derailment that leads to a chemical leak. In 2011, the nuclear incident at the Fukushima Daiichi power plant in Japan resulted from multiple natural disasters. First, an earthquake struck offshore of Japan, triggering a 45-foot-tall tsunami. The tsunami caused damage to the power plant's nuclear reactors, which prompted a containment breach, and radioactive materials were released.<sup>10</sup> In this case, tens of thousands of people were evacuated and some communities are still uninhabited.

## **MYTH 9:** ALL RADIATION IS HARMFUL AND IT IS DIFFICULT TO DECONTAMINATE CONTAMINATED SURFACES.

Not all radiation is harmful. Ionizing radiation is used in medicine, industry, research, and education. The average American receives a yearly radiation dose of about 620 millirem, half of which results from naturally occurring radiation from cosmic rays, radon in the air we breathe, and the Earth.<sup>11</sup> By comparison, a full body computed tomography scan delivers a dose of about 1,000 millirem to patients. Should an individual come into physical contact with radioactive materials, removing the outer layer of clothing can eliminate up to 90 percent of radioactive material. This clothing should be placed in a sealed container, away from people and animals until the incident is stabilized.<sup>12</sup> For more information about radiation emergencies, visit the Division of Public Health's Office of Radiation Control at <https://dhss.delaware.gov/dhss/dph/hsp/orc.html> or the CDC at <https://www.cdc.gov/nceh/radiation/emergencies/index.htm>.

## **MYTH 10:** THINGS ARE BACK TO NORMAL WITHIN A FEW WEEKS AFTER A DISASTER.

It can take weeks, months, or even years for communities to recover from a disaster. Hurricane Michael made landfall in October 2018 and as of July 2019, federal disaster assistance exceeded \$1 billion, with recovery efforts continuing.<sup>13</sup> In August 2019, FEMA Voluntary

Agency Liaisons and Volunteer Florida continued to provide long-term recovery support for Floridians.<sup>14</sup> To learn more about Voluntary Organizations Active in Disaster, visit <https://www.nvoid.org/> and the Delaware chapter at <https://devoid.communityos.org/cms/home>.

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# The DPH Bulletin

From the Delaware Division of Public Health

October 2019

## DPH announces first death associated with using e-cigarette products

Thirteen cases of vaping-related lung injury in Delaware meet the Centers for Disease Control and Prevention's (CDC) case definition of either probable or confirmed, according to the Delaware Department of Health and Social Services (DHSS), Division of Public Health (DPH). One of the 13 individuals reporting e-cigarette, or vaping, product use died.

The CDC reports that as of October 17, 49 states, the District of Columbia, and one U.S. territory, including Delaware, reported 1,479 cases of lung injury associated with the use of e-cigarette products, including devices, liquids, refill pods, and cartridges. Many patients report using e-cigarette products with liquids that contain cannabinoid products, such as tetrahydrocannabinol (THC).

"At this time, no vaping is safe," said DPH Director Dr. Karyl Rattay.



DPH urges Delaware clinicians to report cases of significant respiratory illness of unclear etiology and a history of vaping

to the DPH's Bureau of Epidemiology (24/7) at 1-888-295-5156. DPH is participating in the CDC's multi-state investigation.

Lung injury patients have experienced respiratory symptoms (cough, shortness of breath, or chest pain), and some experienced gastrointestinal symptoms (nausea, vomiting, or diarrhea) or non-specific symptoms such as fatigue, fever, or weight loss. People with underlying chronic respiratory conditions are particularly susceptible.

Individuals who are vaping illegal THC products and need help stopping should contact the DHSS Division of Substance Abuse and Mental Health's Crisis Line. In New Castle County, the number is 1-800-652-2929 and in Kent and Sussex Counties, it is 1-800-345-6785.

For more information, visit the [DPH website](#) or <https://www.cdc.gov/>.



**DELAWARE HEALTH AND SOCIAL SERVICES**  
Division of Public Health



Division of Public Health (DPH) and Bayhealth nurses gave nearly 1,300 flu vaccinations at DPH's Drive-Thru Flu Clinic, held in Dover on October 8, 2019. At left, John T. Healy of Harrington gets his flu vaccination from the comfort of his Colorado 4x4. At right, Bayhealth's Teresa Towne, MSN, RN-BC, NE-BC administers a flu vaccination to Willett Scott of Felton. DPH urges Delawareans to get their annual flu vaccinations soon, preferably in October. For clinic sites, visit <https://dhss.delaware.gov/dhss/dph/fluclinics.html>. Photos by Donna Sharp.

## Delaware Animal Response program hosts emergency shelter training

The Office of Animal Welfare's Delaware Animal Response (DAR) program, based within the Division of Public Health (DPH), is holding an Emergency Animal Shelter Training on November 2 and 3, 2019, at the DPH Training Center in the Edgehill Shopping Center in Dover, Delaware. DAR helps prepare the community for disasters and emergencies that affect companion animals and their owners.

American Humane, a national responder for pets in disasters, will instruct this course. Delaware-licensed veterinarians and veterinary technicians can receive 11 continuing education hours. The training is free for DAR volunteers. Lunch is provided both days. Sign up at [DAR@delaware.gov](mailto:DAR@delaware.gov) or call 302-242-3594.

## Drug Take-Back Day

October 26, 2019



Safely discard unused or unwanted prescription medications.

To find a participating site near you, visit <https://takebackday.dea.gov/> and type your ZIP code.



The Division of Public Health (DPH) held a three-day, full-scale Medical Countermeasures Distribution and Dispensing Exercise on September 26, 27, and 28, 2019. Hundreds of volunteers and DPH staff

participated on Saturday, September 28 at Delaware Technical Community College's Stanton and Terry campuses. Above, volunteer Evans Kamwani, right, playing the part of a patient, listens to medication advice from Maggie Zhou of the Philadelphia College of Pharmacy. Below, volunteer Dawn Yetto of Elkton, at left, Maryland listens carefully to Holly Schiavone of DPH's Northern Health Services. Photos by Donna Sharp.

## DPH adds new health indicators to My Healthy Community data portal

Since launching its My Healthy Community data portal in May 2019, DPH has added several new health indicators. The new data indicators include community safety, maternal and child health, healthy lifestyles, health services utilization, infectious diseases, lead poisoning, suicide, and homicide.

"We highly encourage Delawareans to explore the data on the portal – especially the recently-added datasets – to better understand their community's health and the environment in which they live," said DPH Director Dr. Karyl Rattay.

The portal delivers neighborhood-focused population health, environmental and social determinant of health data to the public, and allows users to navigate the information at the smallest geographical area available, to understand and explore data about the factors that influence health. Residents can search health indicators by street address, ZIP code, census tract, neighborhood, town/city, county and state.

Visit [MyHealthyCommunity.dhss.delaware.gov](https://MyHealthyCommunity.dhss.delaware.gov).

## Providers urged to consider TB

Tuberculosis (TB) is a bacterium that can be inhaled into the lungs when a nearby person with the active disease coughs, sneezes, sings, or laughs. Though TB is rare in Delaware, providers are urged to remain vigilant and to screen and test for the disease whenever there is any possibility a patient might be infected (or exposed).

Latent TB infection (LTBI) occurs when an infected person's TB bacteria are inactive, though they can become active later. Those with LTBI have no symptoms, are not contagious to others, and can be treated to prevent progression to TB disease (when bacteria are active). Between 5 and 10 percent of persons with untreated LTBI will progress to TB disease at some time in their lives, usually within two years after infection.

Signs and symptoms of TB disease include cough that lasts more than two weeks and which may produce sputum or blood; fatigue, weakness, weight loss, night sweats, fever, chills, and chest pain. Most infected children and adolescents are asymptomatic, but symptoms in this age group includes fever, weight loss and growth delay in addition to cough. TB disease can affect any bodily organ but is infectious to others only when it occurs in the lungs or larynx (voice box). Only people with TB disease of the lungs or larynx can spread the disease, typically to household members, close friends, and co-workers. TB disease is treatable and curable, usually by taking medications as directed.

Eliminating tuberculosis requires treating cases, finding and treating infected contacts, and treating latent TB infection.

To learn more about how to prevent and test for TB, visit DPH's TB Elimination Program at <https://www.dhss.delaware.gov/dhss/dph/dpc/tbelimination.html> and the CDC's Division of TB Elimination at <https://www.cdc.gov/tb/default.htm>.

## Naloxone training

Robin K. Brown, a Management Analyst III with DPH's Office of Emergency Medical Services, demonstrates how to administer naloxone, the overdose-reversing medication. The Emergency Medical Services and Preparedness Section held a Naloxone Distribution and Training Event in Millsboro, Delaware in September. Photo by Sharon Smith.



# The Importance of Communication Before and During a Public Health Emergency

Andrea Wojcik

Section Chief, Office of Communications, Delaware Division of Public Health

## ABSTRACT

In a public health emergency, communications are just as important as operations. According to the Centers for Disease Control and Prevention (CDC), "The right message at the right time from the right person can save lives." Similarly, the wrong message at the wrong time can have disastrous consequences – or worse – what if you cannot get your message heard over the rest of the daily media clutter? Unfortunately, this aspect of public health preparedness does not always receive the level of attention it deserves. Here are important elements to consider in any communications strategy, and examples based on local experience.

## COMMUNICATION IS MORE THAN JUST RESPONDING TO MEDIA INQUIRIES AND DESERVES FORETHOUGHT AND PLANNING.

The first time you think about how you communicate to your audiences should not be when the crisis hits. If you do not have a written plan, you should at least have a policy as a starting point. The Division of Public Health (DPH) has an overarching communications policy. At the beginning it sets the tone for DPH communications, stating "The intent is to ensure communications are accurate, timely, and consistent..." The policy covers both internal and external communications with the media, as well as stakeholders, clients, customers, and legislators. It defines what information may and may not be released, who has the authority to decide who may speak on behalf of the Division, provides the process for responding to media inquiries, and clearly establishes the authority for who makes the final decision on what information can be released.

DPH is fortunate to have a fully staffed Office of Communications, which consists of a team of seven individuals with clearly defined roles including a lead spokesperson, someone who manages day-to-day media inquiries, and a social medial coordinator. In the event of a public health emergency that

necessitates the opening of the State Health Operations Center (SHOC), each of these positions may play a primary or a backup role but are dedicated to the communications function. This means they will not be diverted to other tasks.

## EMERGENCY AND CRISIS COMMUNICATIONS SHOULD BE A NATURAL EXTENSION OF YOUR EVERYDAY COMMUNICATIONS ACTIVITIES.

How you say something, what channels and tactics you use to communicate, and what you say (and who you say it to) are all critical elements of a communications strategy. Outside of crisis or intense risk communication periods, as much as possible at DPH we like to do proactive communications regarding a variety of topics ranging from drinking water and food safety, to infectious disease prevention and animal welfare.

We use multiple channels for our communication efforts. Not everything requires issuing a press release. Increasingly, communications are posted to our social media channels as we can see and quantify the amount of reach and interactions our messages are generating. We also have both internal and external newsletters that we publish to share information.

Importantly, **know your message and know your audience**. Not all of our messages require reaching the general public. When we want to reach health care providers, we may issue a Health Alert/Advisory Notice (HAN), send email communications through various associations such as the American College of Emergency Physicians, or directly through our major primary partners including the Medical Society of Delaware, the Delaware Healthcare Association, or the Delaware Academy of Medicine. A recent example of this was when we sent a HAN to providers to share recommended CDC actions for reporting vaping associated pulmonary illnesses, which is not a required reportable disease. That action resulted in DPH receiving reports of potentially related illnesses.

Our **partners are important** to helping us spread our messages, both in non-emergency and emergency situations. That is why the DPH Communications Office works to cultivate these relationships in calmer times, as well as relationships with our counterparts at each of the hospital systems in the state. We are



At DPH's September 28, 2019 preparedness exercise, author Andrea Wojcik, DPH's Director of Communications, served as the Public Affairs Officer for the Dover site. Photo by Donna Sharp.

also willing to share their messages with our staff and cross-post topics important to them on our social media channels. If you have not established those partner relationships, and don't have solid interaction and a willingness to assist each other when it's calm, you may not get much help when you must get a critical message out. Very recently, the benefits of our established relationships with our hospital communications partners became evident when DPH began investigating a potential infectious disease in a patient who presented to one of the hospitals. Within an hour of learning of the incident, two of my counterparts from hospitals involved in the investigation response, were calling me to initiate conversations around media statements and investigation process. DPH closely communicated with them throughout the day including sharing draft statements and responses to multiple follow-up questions by media. DPH also communicated with non-involved hospital spokespersons to advise them of the situation. Ultimately, all communications colleagues expressed gratitude for our open and ongoing dialogue and spirit of collaboration.

While proactive messaging is fun, we do a great deal of risk communication as part of our everyday work. Risk communication may not rise to the level of crisis communication but it is more involved than everyday communication activities. The CDC's Crisis & Emergency Risk Communications (CERC) guidelines highlight six important steps in risk communications:

## BE FIRST, BE RIGHT, BE CREDIBLE, EXPRESS EMPATHY, PROMOTE ACTION, AND SHOW RESPECT.

For us at DPH the first three items go hand-in-hand and really can be summed up like this: The two most important overarching themes in communications strategy – whether it is your standard plan or a risk or crisis communications plan – are **trust and accuracy**. These are your currency – and are as valuable as gold – with the public, your stakeholders, and the media. It is vital to build a good relationship with the media during calmer periods. For sure, the first contact you have with a media outlet should not be when you need to push out crisis messaging. You should have an ongoing established relationship with reporters and editors. It is important to be responsive to their questions during non-emergency periods so that when you really need them, they trust where the information is coming from, and they also trust that you will answer what questions you can.

During both crisis and non-crisis situations, accuracy is also of paramount importance. It can be easy to get caught up in the sense of urgency some reporters may throw at you when things are moving fast and conditions are changing rapidly. They need it now, now, now. "We need to inform our viewers/readers/listeners as soon as possible," they say. However, if you share information before it is fully vetted, and have to explain that you were wrong earlier, then how are they or the public going to trust what you say going forward?

Some messages may be appropriate for fluid or emergent situations:

- "This is an evolving situation and we will update you when we have more information."
- "We have just learned of this situation; let me get some information and get back to you."

- "I'm not the authority on this subject, so let me see if I can set you up with someone who is in the best position to answer your questions."

If you fall into the 'we need it now' trap, and share either personal health information, HIPPA (Health Insurance Portability and Accountability Act of 1996) protected information, or sensitive security-based information, you not only lose trust with the public, but also with any partners on whose toes you stepped. Always remember that in an emergency, we need people to trust us and do exactly what we ask of them in order to protect their health and their safety. You only get one chance to get it right.

Let me share an example where we worked hard to be first, be right, be credible, express empathy, promote action, and show respect. In 2018, we identified the first case of rabies in a human in decades. As soon as rabies was confirmed, we knew we needed to announce it, and knew that this would generate a significant amount of media interest. Instead of subjecting our leadership to multiple requests for interviews, we organized a media call (Be First). In the room where we hosted the call, we had not only our Public Health Director, but also our Medical Director, State Epidemiologist, partners from the Delaware Department of Agriculture, and even federal partners on the phone. Everyone who had relevant expertise was available to answer questions in one place (Be Credible). After introductions and announcing the purpose of the call, the first statement our Director made was, "First, on behalf of the entire Division of Public Health, let me express my heartfelt sympathy for the victim's family. Our thoughts are with them during this extremely difficult and emotional time." (Express empathy)

Our talking points, which were prepared before the call, included letting the media know that the general public was not at risk and human-to-human transmission is very rare, preventive measures that everyone can take, and an honest assessment of what we could tell the media. Said DPH Director Dr. Karyl Rattay,

*"Let me tell you what we know about the victim and what we can share. I think it is important for members of the media on this call to know that we as the Public Health agency while protecting the health of the public are also bound to protect this woman's identity. Failing to do so would be a violation of HIPPA laws. You will always want to know more than we are able to share, because even the deceased have a right to have their medical information protected. The geographic area in which she lived is small enough, that when you continue to add in what seem like innocuous details, it would make it easier for someone to identify her."*

*(Promote Action, Show Respect, and Be Right).*

When it comes to risk communications, know that you will have different plans for each situation and you need to consider different audiences. During our rabies response, in addition to notifying the public, we needed to advise the victim's neighbors to stay away from unfamiliar animals.

Also in 2018, we needed to generate awareness of potential exposure to Tuberculosis (TB) among staff, patients, and visitors to a long-term health care facility in Wilmington. Our communication audiences and tactics were different than those within our rabies response. Our TB risk communications plan included a press release and a media call, as well as letters to current and former patients and staff of the facility, the

announcement of testing days, and the opening of a call center. The call center was used both to field questions from the public and also to make outgoing follow up calls to potentially affected individuals to ensure they received the letter that was mailed to them. To get our call center up and running, we needed to identify and train volunteers, and write scripts for the call center operators. A fully detailed procedure for standing up a Call Center is part of DPH's 89-page communication plan called the Crisis and Risk Communication Annex, which is part of the overall State Health Operations Plan.

The plan outlines roles and responsibilities of each member of the communications team, identifies a variety of resources and communication channels to be used, includes a template for message development and provides examples, ensures we are thinking about audiences with access and functional needs, and identifies procedures for communicating during a power outage.

In the event of an emergency when the SHOC is activated, the Office of Communications Section Chief functions as the lead spokesperson (Public Affairs Officer - PAO) and is embedded in the SHOC with Operations. Other staff are utilized as needed. All public health media inquiries are directed to the SHOC and are answered by the PAO or designee. Depending on the scale of the emergency, the PAO may work with the spokesperson for the Delaware Emergency Management Agency to request assistance

in setting up a Joint Information Center (JIC). The JIC can be located anywhere there is access to phone lines and computers, and consists of trained spokespeople from other state or county agencies who function and respond on behalf of one central agency, under the coordination and guidance of the PAO.

Whether handling crisis or everyday communications, these are my top recommendations for being successful:

- Develop your three top messages and repeat them often.
- Stay on message. Do not be diverted by off-target questions. Circle back to your top three messages.
- Be expressive – show compassion and empathy.
- Be conversational and avoid jargon and acronyms.

You should be able to scale your communications plan up or down, depending on the nature of the situation. Successful communications are about not only what you say, but how you say it. To make sure your messages are on target, visit the CDC at <https://emergency.cdc.gov/cerc/resources/index.asp> for additional guidance.

## REFERENCES

Centers for Disease Control and Prevention, Crisis and Emergency Risk Communication, <https://emergency.cdc.gov/cerc/>

## MINI TIP

### ORGANIZE HOUSEHOLD DOCUMENTS TO REBOUND FASTER AFTER EMERGENCIES

When personal and financial documents are organized, it is easier and faster to rebound from disasters.

Compile the names, addresses, phone numbers, account numbers, and passwords for mortgages, bank accounts, credit cards, and insurance policies. Gather the full names and Social Security numbers of all household members, annual household income, birth and marriage certificates, and copies of utility bills for proof of home address. Print them out and back them up on a flash drive, and store them at home in a fireproof safe as well as in a bank safety deposit box or at a trusted relative's home.

Homeowners and renters should inventory their possessions. Use a cell phone to videotape and take still photos of household and yard items, including vehicles. Since there may be no cell phone service for days or weeks after a disaster, back up the inventory on a computer hard drive and on a flash drive. Keep the flash drive with the financial documents. The Delaware Department of Insurance has a home inventory guide; visit <https://insurance.delaware.gov/>

The University of Delaware's Center for Disabilities Studies website, <http://www.allreadyde.org>, features a household emergency planning form. Review the disaster coverage of homeowner's insurance policies annually. Renters should purchase renter's insurance.

For more information, visit The Emergency Financial First Aid Kit (EFFAK) (<https://www.ready.gov/financial-preparedness>), a joint publication from Operation Hope, Inc. and the Federal Emergency Management Agency (FEMA publication #532). Available in English and Spanish, EFAK helps plan for financial emergencies and provides instructions for establishing accounts during disaster recovery. Additional preparedness tips and resources are available at [www.ready.gov](http://www.ready.gov) and [MyMoney.gov](http://MyMoney.gov).

# Delaware Academy of Physician Assistants

## 2019 Annual Conference

October 25-27  
The Hyatt Place  
Dewey Beach, Delaware

Audience: Open to all PAs, NPs, MD/DO and students

Cost: Join DAPA for only \$100/yr and save \$100 on your registration and receive additional CME offerings throughout the year!

Save \$50 with early registration before September 15th

Before September 15th:

\$400 non DAPA members  
\$300 DAPA members  
\$100 students

After September 15th:

\$450 non DAPA members  
\$350 DAPA members  
\$150 students

CME: 14.00 Category I CME credit\*

Registration: [www.delawarepas.org](http://www.delawarepas.org)

Schedule: Friday: 5-7PM Cheese and wine reception & Silent Auction  
Saturday/Sunday: 8-3:30PM CME lecture series

Topics include:

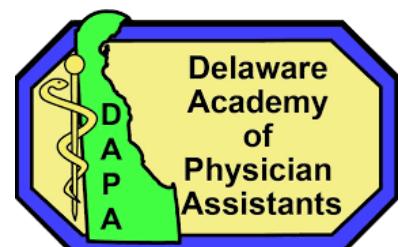
- Evaluation of the forensic patient
- Provider wellbeing and burnout prevention
- Syncope evaluation
- Medical malpractice
- Advances in stroke prevention and treatment
- Evaluation of the dizzy patient
- AND MORE!

Scholarship: If you are a PA working with an underserved population in Delaware, DAPA would like to offer a scholarship to attend the conference. A limited number of scholarships are available and PAs with little to no CME allowance will be given preference. Please contact [MattC@delawarepas.org](mailto:MattC@delawarepas.org) and include the population you serve and CME resources by Sept. 1st to be considered for the scholarship.

\*This activity is pending approval for a maximum of 14.00 AAPA Category 1 CME credits by the AAPA Review Panel.

PAs should claim only those credits actually spent participating in the CME activity. This activity was planned in accordance with AAPA CME Standards for Live Programs and for Commercial Support of Live Programs.

NPs can often claim AAPA Category 1 CME credit as continuing education with AANP and ANCC. AAPA recommends that NPs check with their certification/licensing authority to confirm that AAPA credit is acceptable.



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Fogarty funds novel study  
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FOGARTY INTERNATIONAL CENTER • NATIONAL INSTITUTES OF HEALTH • DEPARTMENT OF HEALTH AND HUMAN SERVICES

## Innovative mHealth projects receive \$5M from NIH

Fogarty and its partners from across NIH plan to award \$5 million over two years to support innovative exploratory and developmental mobile health research in low- and middle-income countries (LMICs). The 13 new awards are made through Fogarty's mHealth program, which aims to catalyze innovation through multidisciplinary research, while strengthening LMIC mHealth capacity. Recipients will use mobile and wireless devices such as smartphones and tablets to improve health outcomes, health care services and health research.

A majority of the awards will support projects in sub-Saharan Africa, with many related to the diagnosis and treatment of infectious diseases. Researchers with the Boston University Medical

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Photo by Dr. Bill Tierney



Fogarty's mobile health research program aims to catalyze innovation in low- and middle-income countries by supporting multidisciplinary projects using wireless devices to improve health.

## \$9M awarded to establish independent research careers

To bolster promising global health research careers, Fogarty and its partners are awarding up to \$9.2 million over five years through two career development programs. The grants will help ensure that advanced postdoctoral scientists and junior faculty have a pathway to independence, with protected time for research activities under the guidance of experienced mentors in developing countries and in the U.S.

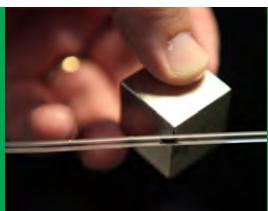
Recipients of 14 Emerging Global Leader Awards hold junior faculty positions and research scientist appointments at institutions in Bangladesh and India, and across Africa—in Ghana, Mali, Nigeria, South Africa and Tanzania. Four additional U.S. scientists supported through the International Research Scientist Development Award (IRSDA) will be conducting studies

in China, Malawi and South Africa, with a majority of their supported time spent at institutions in low- and middle-income countries (LMICs).

The programs fund research relevant to the health priorities of the host countries, covering all health-related disciplines. Projects addressing women's health will explore perinatal depression in adolescents, hypertension during pregnancy and improving cervical cancer detection. Many will investigate solutions in the field of HIV and related infections, for instance working to better understand and treat HIV-related pain, identify biomarkers for Kaposi's sarcoma, reduce HIV transmission for young women, improve home-based ART interventions and explore treatments for HIV-associated Multicentric Castleman disease. They

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## FOCUS



### Fogarty grantees boost biomedical engineering in Africa

- Open-access book details case studies, lessons learned
- Bioengineers can advance frugal design, mobile health
- Africa ripe for technology innovation, entrepreneurship

Read More on pages 37 - 40

## Innovative mHealth projects receive \$5M from NIH

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Campus will focus on screening children for pneumonia in Zambia, comparing traditional x-rays to cellphones with ultrasound transponders. Tulane University scientists will develop a cellphone microscope platform to rapidly screen children in Kenya for tuberculosis, while making improvements to the storage and transport of screening materials. University of Georgia investigators will adapt video directly observed therapy in Uganda to improve adherence of tuberculosis treatment, leveraging input on perceived barriers from patients and providers.

In the area of injury research, University of Texas Southwestern Medical Center will build mobile tools to report road traffic injuries in Nigeria, with the goals of reducing transport time for victims and improving information provided to first-responders.

A number of projects in the sub-Saharan African region will focus on improving health outcomes for people with noncommunicable diseases. The Sloan Kettering Institute will train radiologists in Nigeria to perform mobile ultrasound-guided breast biopsies, building capacity for point-of-care breast cancer diagnosis. Through an existing partnership in Lesotho, another team from Boston University Medical Campus will

adapt an animated online tool that identifies and mitigates health risks for women before pregnancy. In Kenya, researchers with Michigan State University will bring together public health professionals and software developers to create a mobile application to help adolescents manage Type 1 diabetes. To improve self-care for heart failure patients in Uganda, scientists with Yale University will implement a scalable, locally relevant patient application that runs on low-cost feature phones, with an associated dashboard for clinicians.



Photo courtesy of Dr. Marc Mitchell

Projects throughout Asia will also explore ways to leverage mobile health to treat chronic diseases. Rutgers Biomedical and Health Sciences School of Health Professions will create a smartphone app for self-management of gestational diabetes in Nepal, while helping deliver relevant information to clinicians. Also in Nepal, researchers with the University of California San Francisco will develop a mobile application to provide ongoing training to community

health workers to improve depression treatment.

In Thailand, investigators with Massachusetts General Hospital will enhance a smartphone application for homebased monitoring of patients with chronic kidney diseases, comparing patient outcomes to those of patients using handwritten logs. An interdisciplinary team of U.S. and Chinese investigators led by the University of Pennsylvania will use a smartphone app to analyze biopsy results and transmit data to doctors, health records systems and surveillance teams to improve cancer therapy in low-resource areas.

In the Dominican Republic, researchers with Northern Illinois University will measure the effectiveness of a mobile application that delivers mental health treatment provided by community health workers.

Fogarty's mHealth program, which has funded more than 60 projects since it launched in 2014, has attracted interest from Institutes and Centers across NIH. The program, which initially provided up to two years of funding, now offers two to five years of support.

### RESOURCES

Awards: <http://bit.ly/mhealth-lmics>  
Apply: <http://bit.ly/NIHmhealth>

## \$9M awarded to establish independent research careers

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will also study treatments for HIV-associated tuberculous meningitis, detection of multidrug-resistant TB, interactions between antiretroviral and tuberculosis drugs, and sex differences in immune response and risk for developing TB.

The new investigators will be researching chronic conditions, such as locally relevant innovations in cardiovascular disease care, and building a mobile application to help detect lung cancer. Some grantees will look into issues unique to their

regions, countries and communities—sickle cell disease in infants, the role of genetics in craniofacial and dental anomalies, treatment for Guillain-Barré syndrome and causes of *Shigella flexneri* infections.

### RESOURCE

Awards: <http://bit.ly/careerdevawards>

# Scientists in Madagascar study novel methods to predict disease spread

Zoonotic diseases—*infectious diseases that spread from animals to humans*—are a major health threat in Madagascar. To understand why some people become conduits for these diseases, and whether farming practices or socioeconomic factors might influence transmission, a team of Fogarty-funded researchers will apply new analytical approaches for predicting infection. The grant to Duke University, totaling nearly \$2.4 million over five years, recently was awarded through the Ecology and Evolution of Infectious Diseases program, a joint initiative between the NIH and the National Science Foundation.

“Most of the work in ecology, evolution and infectious disease has focused on the community composition and the abundance of different animal and human hosts. And we’re really trying to model how hosts are coming into contact with one another, or how they’re sharing habitats, and using that to generate a mathematical representation of disease transmission,” said Dr. Charles Nunn, an ecologist and professor at Duke University who is the principal investigator on the project.

Nunn has assembled an interdisciplinary team of scientists with expertise in ecology, mathematics, sociology, evolutionary medicine, anthropology and environmental economics. Investigators will work in four villages around Marojejy National Park in the northeastern part of the country. They will collect biological samples and location data from about 250 residents from each location, as well as from small animals such as rodents and bats, and domestic animals including dogs, cows and pigs. The villagers and their domestic animals will be equipped with GPS devices to track to their movements. People will also be surveyed about their household size, education and other demographics, their health, social network, agriculture and other economic activity, land-use decisions and conservation attitudes.

Using innovative mathematical frameworks, those pieces of information will be brought together to generate networks representing interactions between people and animals. The team will then assess whether the transmission models they generate actually predict patterns of infection.

Zoonotic diseases in Madagascar that will be studied include the plague—which is typically spread to humans through flea bites—and leptospirosis—which



*A new Fogarty-funded project in Madagascar will support researchers like Tamby Ranaivozon to develop and apply new frameworks for predicting the spread of zoonotic diseases.*

people can get when they come in contact with water contaminated by urine from an infected animal. While those diseases may not be common in other countries, the research could have broad implications.

“Emerging diseases are still an issue. We see that with Ebola in the Democratic Republic of Congo and West Africa, or other outbreaks of infectious diseases, many of which come from wildlife or domesticated animals,” Nunn said. “We hope the general principles and methods we’re using in Madagascar will apply more generally to other locations in the world.”

While this is Nunn’s first Fogarty grant, he has years of experience working in Madagascar. The island country off the coast of East Africa provides an interesting environment for the research, according to Nunn. It is one of the world’s poorest countries, but it is rich in biodiversity, with many species that are unique to the island. The population is growing and people are now encroaching on forests. In addition, land use is changing as some communities shift from subsistence farming to growing vanilla as a cash crop.

This project, like others Nunn has led, has a training component with Duke students working alongside Malagasy trainees doing field work in remote areas. In addition to research skills, Nunn says he facilitates cultural exchange, with trainees eating at the same table and learning each other’s language and culture.

“Our work is at the nexus of human health, conservation, ecology and evolutionary biology. There’s so much potential for that kind of research, including in the United States,” Nunn said. “I really hope we’re going to provide some new frameworks for investigating these questions, improving health and also helping conserve biodiversity.”

## RESOURCES

<http://bit.ly/EEIDaward2019>

# PROFILE

## Fogarty Fellow uses legal skills to study human rights and HIV/AIDS in Kenya

As the first lawyer to participate in Fogarty's Global Health Fellows and Scholars program, Neiloy Sircar examined human rights and HIV in Kenya. The country has been encouraging testing and notification of partners and children who may be at risk as part of its strategy to control HIV and link more people with treatment. Sircar and the research team wanted to know if those practices and policies are effectively using what's known as a rights-based approach, especially when it comes to consent, privacy and confidentiality.

"Are these programs actually protecting, promoting and fulfilling the human rights of those people who are benefitting from the programs? And if they are, how are they doing it? And if they aren't, let's identify ways to improve," Sircar said of the rationale for his fellowship project, which was supported by Fogarty and the Afya Bora fellowship program.

He was hosted by a prominent NGO known as KELIN—the Kenya Legal and Ethical Issues Network on HIV and AIDS—and was mentored by its director, along with faculty from the University of Washington. Sircar studied human rights and global health law at Georgetown University.

He worked with KELIN's lawyers and its partner community groups to conduct qualitative research. They wanted to learn what health care providers and at-risk populations know about legal and human rights and to identify barriers that might keep people from getting tested. The research focused on four key populations at risk of HIV, stigma and discrimination—young women, men who have sex with men, sex workers and injection drug users. The activities of the last three groups are illegal in Kenya.

Sircar wrote the guidelines for in-depth interviews and focus group discussions. He also designed a series of predominantly open-ended questions including: "Many people in your group are not testing for HIV. Why do you feel that is?" "Are you familiar with your legal and human rights?" "Do you feel there are any risks disclosing or sharing HIV status?" Questions for health care providers



**Neiloy R. Sircar, J.D., LL.M.**

Fogarty Fellow: 2018-2019

U.S. Institution: University of Washington

Foreign Institution: Kenya Legal and Ethical Issues Network on HIV and AIDS (KELIN)

Research topic: Human rights and HIV

aimed to assess their understanding of human rights and whether they've received sensitivity training or any other related instruction.

The interviewers were Kenyans from the community organizations that work with the key populations. Sircar intentionally was not part of that process. "Seeing a foreigner in the room might affect how people answer questions," he said. "What was important to me was that the people who were giving us candid, honest answers felt safe."

The research team is just beginning to analyze the information collected. Sircar said his experience in Kenya taught him how to navigate the Institutional Review Board process, conduct qualitative research, do data analysis and manage a team. He credits the Fogarty fellowship with leading him to his current position as a postdoctoral scholar at the University of California, San Francisco and sees his career path heading to a U.S. institution focused on public and global health and human rights.

Sircar said colleagues have been excited to hear about his fellowship and how skills in law, policy, governance and regulation can complement or bring a new perspective to their research projects.

"There are a range of questions at all levels of public health and global health where having a legal background or a legal person on the team can be very helpful," said Sircar, who wants to raise awareness among both the health and legal communities. "We are still seen as a fish out of water, the odd person in the room. But it doesn't take much to articulate what it is that you can do to help this work along, to help achieve something good."

*Dr. Simani Gaseitsiwe began his research career nearly 20 years ago at the height of Botswana's AIDS epidemic. He took a job as a lab assistant for the Botswana Harvard Partnership (BHP), a research and training collaboration between the government and Harvard University, led by pioneering Harvard AIDS researcher and longtime NIH and Fogarty grantee, Dr. Myron "Max" Essex. Today, Gaseitsiwe directs BHP's laboratory in Botswana, trains young scientists and is among the accomplished researchers contributing to the NIH-funded Human Heredity and Health in Africa (H3Africa) project.*



### What Fogarty training did you receive?

Professor Max Essex has been my mentor throughout my career. When he started the lab in Botswana in 2000, I was recruited, having just completed my undergraduate degree. In the beginning, the lab was focused on very basic HIV clinical laboratory work, doing CD4 counts to check disease progression, viral loads and patient monitoring. At the time, the epidemic was really bad because that was before the advent of antiretroviral therapy in places like Botswana. After a year, I had the opportunity with Fogarty support to go to Max's lab in Boston to do more advanced molecular biology training, to do genotyping or sequencing the HIV strains that are circulating in Botswana. It was more hands-on training, which was very important at the time because we didn't have the capacity to do that kind of work here. It was a very cosmopolitan environment in Boston, with scientists from all over working together. Coming from my country, where there was basically no one doing HIV research, to train in such a prestigious institution like Harvard was very inspirational and motivated me to pursue further studies including a Ph.D.

### How has your career progressed?

I have gone from being one of three lab assistants in a new operation capable of only doing basic HIV clinical lab work, to now being the director of 50 staff and a sophisticated, three-story facility with an expanded clinical laboratory, a million-sample repository, a research lab, sequencing facility and training space. Today, we have a number of students who are training at master's, Ph.D. and postdoctoral levels, and we attract students not only from the region but also internationally. From the humble beginnings to now, it's been really great to watch the lab develop over the past 18 years.

### What research topics are you studying?

I've spent a lot of time trying to diversify the research agenda of BHP because most of the focus had been on HIV, but the situation is not as bad as it used to be. I've diversified the research portfolio to include viral hepatitis, which is under-researched in Botswana although it is highly prevalent here and in other sub-

Saharan Africa countries. We've had a few projects looking at the TB incidence in patients who are on antiretroviral therapy because TB co-infection in HIV-infected individuals is the main type of TB in Botswana. Almost 60-70% of the TB patients are also HIV-infected, so I think there is a need to study the two infections together. The research that's happening here is a byproduct of my Fogarty training. So, you can multiply that by a factor of 10 or 20 because that's how many of us have had the opportunity for substantial training.

### Why is local research capacity important?

It's something I've always had a passion for, especially learning from what Max has done in Botswana. There is a dire need for individuals who are trained to the Ph.D. level to conduct research in places like this. By the time we really began to appreciate the magnitude of the HIV epidemic in my country, it had already reached levels where it was difficult to manage. I think we learned that there was a need to respond to outbreaks in a more timely manner. We need to develop human capacity first of all, because those are the people who will drive the programs to control the epidemics. It's not only HIV, we are also seeing Ebola and other diseases spreading in nearby countries. I think Fogarty in its nature was, and continues to be, very instrumental in supporting the training of people from a resource-limited setting to go to more developed countries to train, and then come back home and be able to be the drivers of the research, ultimately trying to control the epidemics there.

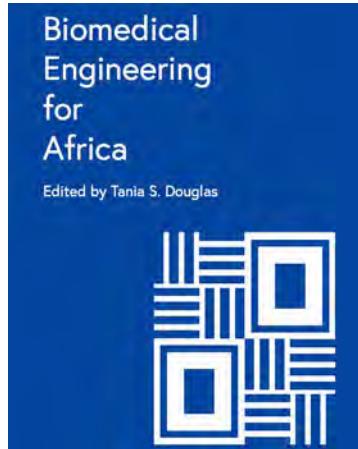
### What is your approach to mentoring?

My approach is to get young people to come into the lab and, to a great extent, allow them some freedom. I learn from all these graduate students that I have, because they are younger, they tend to look at things in a different way and question concepts that we take for granted. I also have come to appreciate diversity. So, whenever possible I always try to attract people from different backgrounds into the lab. You don't want a homogenous group because your approach, your solutions will be similar. But if you take a group from different backgrounds, then the approach and the solution will be more holistic.

# FOCUS

## Fogarty grantees publish book to boost biomedical engineering in Africa

Africa's unique context and health care challenges would benefit from specially tailored technology solutions, rather than its current reliance on imports from industrialized nations. Appropriately designed technologies can be used in the prevention, diagnosis, monitoring and treatment of disease, which can save lives as well as money. To meet that need, the continent must develop its own biomedical engineers who are familiar with local needs and resource constraints, according to a book published recently by Fogarty grantees and collaborators.



Published with Fogarty support, the 22-chapter book is freely available at [http://bit.ly/BioEng\\_Africa](http://bit.ly/BioEng_Africa).

conditions is a faster, better and more cost-effective alternative, they said.

Grounded in the African context, the 22-chapter open-access volume is intended as a resource for practitioners, academics, students and university leaders planning to establish new biomedical engineering programs. Although focused on Africa, the publication is relevant to other low- and middle-income country (LMIC) settings and provides insights to guide global health initiatives focused on technology innovation. The book was produced with support from Fogarty and Northwestern University (NU) in Chicago, and was published by the University of Cape Town (UCT) Libraries. Nearly 90 authors from NU

"The field of biomedical engineering is central to health technology innovation," the authors suggested. "Transplanting healthcare systems and technologies from high-income countries to resource-limited settings is slow and expensive, and in many instances, challenging if not impossible." Developing new healthcare delivery methods and devices tailored to LMIC environments and



*Biomedical engineers are needed in Africa to develop locally relevant technologies and applications to improve health.*

Africa contributed to the volume, which was edited by Dr. Tania S. Douglas, a biomedical engineering professor at UCT. A Fogarty Framework Innovation grant to NU helped establish departments of biomedical engineering at the Universities of Ibadan and Lagos in Nigeria, and facilitated collaboration with biomedical engineers at UCT.

**"The field of biomedical engineering is central to health technology innovation."**

— BIOMEDICAL ENGINEERING FOR AFRICA

In Africa, economic growth, increasing healthcare expenditure, the availability of digital technologies, and young populations provide opportunities for the development of robust health technology innovation systems, according to the book's authors. For local innovation to become the norm across the continent, capabilities must be developed to conduct needs assessments, market analyses, product design, prototyping and testing, manufacturing, distribution and management. To produce products that are actually used, biomedical engineers must develop an in-depth understanding of the social factors that impact technology adoption.

Resource: [http://bit.ly/BioEng\\_Africa](http://bit.ly/BioEng_Africa)

### **Stronger linkage with clinicians needed**

Creating technologies suitable for LMICs is not the only engineering need. More than half of medical equipment in developing countries is defective, according to WHO estimates, which causes delays in diagnosis and treatment, higher costs and sometimes loss of life. One book chapter makes the case for closer collaboration between engineers and clinicians to improve maintenance capability, as well as advance engineers' understanding of the technologies needed to improve patient care. For instance, in hospitals lacking incubators, engineers could develop low-cost baby warmers to reduce newborn deaths. However, identifying the problem is only the first step. A needs assessment should be performed, the authors suggested, noting the WHO recommends customization of the process according to the specific circumstances.

Best practices might include:

- Having both groups of personnel agree on the unified goal of establishing good patient outcomes.
- Fostering mutual understanding and respect for the unique roles and skills each group brings in working towards achieving the common goal.
- Ensuring good communication in problem-solving activities related to patient care.
- Raising awareness with hospital management and health system administrators of the benefits of clinician-biomedical engineer cooperation in order to garner their support.

### **Fogarty grant helps spur biomedical engineering in Nigeria**

Nigeria's University of Ibadan began its graduate program in biomedical engineering in 2017, partly with support from Fogarty. It provides students with a broad and flexible education in engineering, biological science and medically-related fields; and develops skills in innovation, creativity, adaptability and critical thinking to solve problems in the biomedical industry. Students can pursue a one-semester certificate, two-semester diploma or four-semester master's degree. The program is intended to attract students from across Africa.

The University of Lagos has a longer tradition of biomedical engineering, with a unit having been established in 1974. Now an academic department, it trains students at all levels in biomedical engineering. Fogarty funding helped the university develop a more robust interdisciplinary collaborative research culture.



### **Africa is ripe for entrepreneurship**

Africa has received global attention in the 21st century as the continent of growth and opportunities. One of the book's chapters explores its current climate for innovation, noting there has been considerable debate on how African governments can create jobs and develop home-grown business leaders able to access global markets and propel growth. That is partly dependent on the capacity and willingness of African countries to create an environment conducive to the emergence of entrepreneurship in the public and private sectors, the authors said.

There have already been a number of successful products developed by Africans, for use in Africa, which are described in the text. The Cardio-Pad, created by Cameroonian Arthur Zang, is used to detect cardiovascular disease in patients who live in remote areas by providing wireless data transmission to a cardiologist. Deaftronics, a company in Botswana, built a prototype charger for solar power hearing aid batteries that last for three years and can be used with many hearing aids available on the market. It was developed for the hearing impaired in developing countries who are unable to access electricity. In South Africa, Power Free Education Technology produced a wind-up Doppler ultrasound fetal heart rate monitor to detect fetal distress for use in rural areas.

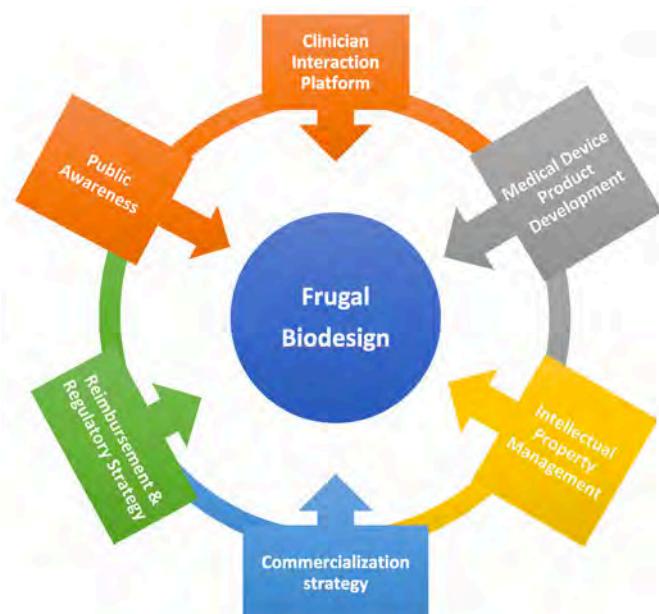
The book contains several chapters detailing the process used to develop technologies in Africa including an innovative approach to improve burn wound treatment, an infant warming device and a needle disposal machine.

Future successes will depend, in part, on the "robustness" of higher education to train and develop biomedical engineers, the authors said. "The challenge in developing an African entrepreneurial biomedical engineering environment is not only the lack of infrastructure but also the lack of innovative capacity and ecosystems that support innovation, as well as a fragile healthcare system on the continent."

There are few biomedical engineering (BME) programs in Africa prepared to meet these needs, the publication noted. In 2008, only 12 universities in six African countries offered BME programs, compared with nearly 230 universities in North America. In 2012, a group of African universities founded the African Biomedical Engineering Consortium (ABEC) with the goal of increasing engineering capacity and nurturing entrepreneurial and innovative skills across the continent. It has developed a standard undergraduate BME curriculum that has been adopted by some of the participating universities.

### Developing frugal design for low-resource settings

Frugal Biodesign—a unique approach to medical device design that is suited specifically to developing countries—is examined in one book chapter. The course, developed at UCT in South Africa, is aimed at stimulating postgraduate students studying BME to devise inexpensive and, more importantly, innovative solutions to medical problems. It recognizes the limitations that South Africa and other developing countries experience in terms of human, financial and physical resources. The medical devices that the students work on during this course are informed by clinicians. The course adopts a cyclical and dynamic approach that involves the constant exchange of information between multiple stakeholders.



The stages of the Frugal Biodesign approach.

The two-semester, 10-month curriculum is intended to fast-track the process of ideation, which begins with identifying a need and continues until proof of concept is achieved. The course prepares students to develop medical devices that are appropriate to needs, at low cost. It takes into consideration the constraints which hinder technological development in low-income settings such as lack of funding, skilled personnel and infrastructure. By leveraging the talents of a pool of students drawn from different engineering backgrounds and the insights from clinical partners, an interdisciplinary approach is applied to the problems being addressed.

One UCT success has been the adoption of 3D printing to produce medical devices, such as a crutch that attaches to spectacles to elevate the upper eyelid in patients with *myasthenia gravis*, a condition that can cause eyelids to droop and for which treatment options are limited in low-resource settings. UCT released the design as an open source innovation that can be downloaded at no cost.

### Mobile health is powerful platform for healthcare

With the ubiquity of cellphones in much of Africa, mobile health holds tremendous potential for extending healthcare services to remote areas and poor people in Africa. One section of the text is devoted to exploring these opportunities. Many disease outbreaks in Africa have been caused by lack of, or late, reporting. While most countries have implemented successful surveillance systems that include training for healthcare workers, many are still paper-based. The high penetration rates and increasing adoption of mobile devices in Africa has the potential to enhance the development of effective disease surveillance systems.

The main drivers for mHealth in Africa include high mobile penetration, increasing cellphone subscriptions and the high burden of disease, the authors said. There are opportunities for mHealth projects to provide health education and create awareness, deliver personalized and remote patient monitoring, conduct disease surveillance and build clinical decision support systems. Possible challenges include low health literacy levels; poor network, power supply and hospital infrastructures; socio-cultural barriers; and lack of political will by governments to support mHealth projects. To build scalable and sustainable mHealth systems, there is need to foster strong public-private partnerships, develop mHealth systems that can be easily integrated into existing healthcare systems, and produce health information systems that ensure the security, integrity and privacy of patient data.

### Incorporating bioethics into innovation

Biomedical engineering is unique as an engineering specialty, in that it is a synthesis of engineering principles and medical practice, the authors noted. The unique professional identity of biomedical engineering requires ethical frameworks that are sensitive to both medical and engineering standards. While engineering ethics is narrowly focused on safety, and medical ethics on patient care, biomedical engineering ethics is at the intersection of safety and patient care, beginning at scientific experimentation and design, and extending through medical practice and administration. Understanding the history of engineering ethics and biomedical ethics is essential to understanding the evolution and future of modern biomedical engineering ethics, according to the authors.



A 3D-printed device attaches to spectacles to elevate the upper eyelid in patients with *myasthenia gravis*, a condition for which treatment options are limited in low-resource settings.

## Protecting intellectual property

Developing novel biomedical products including drugs, devices, assays and equipment is a lengthy, and possibly expensive, process that starts with an innovative idea that potentially meets a critical medical need. Intellectual property protection may be needed to prevent the concept from being used or even marketed by another party, the authors said in a chapter devoted to the topic. Trademarks, patents, copyright and trade secrets are some issues that may be considered. Commercialization paths such as licensing and establishing spin-off companies may also be relevant. In addition, biomedical engineers must obtain regulatory approval to bring their products to market. After proving the safety and efficacy of their invention, they then will need to convince clinicians to adopt it, which can be time consuming.

Research universities may play a role in the process, ranging from educating the innovators to developing prototypes. Universities may even assist in licensing and start-up activities. A robust development pipeline involves identification and protection of the intellectual property and a clear, well-defined partnership between the institution and its inventors.

## Regulating medical devices in Africa

The book also contains an overview of medical device regulation in 10 African countries, noting they have a strong focus on imports, which is not surprising given their heavy reliance on medical devices from developed countries. For example, South Africa, Nigeria and Egypt—

*Tiny magnets and plastic tubing are being developed by Fogarty grantees to provide a low-cost method of diagnosing malaria.*

Photo courtesy of Dr. Ayesha Kamal



Mobile health solutions hold much potential to improve health in low-resource settings.

considered to be the largest markets and economies in Africa—continue to be dominated by the supply of orthopedics, prosthetics, patient aids and consumables from the U.S. The regulatory approval process for medical devices in Africa is lengthy, not transparent and skewed toward controlling entry into the market of substandard imports that pose a health risk, the authors reported. None of the ten countries discussed has specific regulations or regulatory bodies dedicated solely to medical devices, which can cause difficulties and delays in the process.

However, medical device regulations in Africa are designed along the framework of models used in developed countries. For example, the requirements for importation and exportation of medical devices in South Africa, Algeria, Kenya and Ethiopia are similar to the internationally recognized regulatory programs in Europe, the U.S. and Australia. This is important in that it aligns African countries with a harmonized framework for medical device regulation. In an era of globalization, this facilitates cooperation among regulators and the industry.

Beyond regulations, much could be done to promote the development of medical device industries in African countries. In Ethiopia, Ghana, Kenya and Tanzania, a WHO framework for

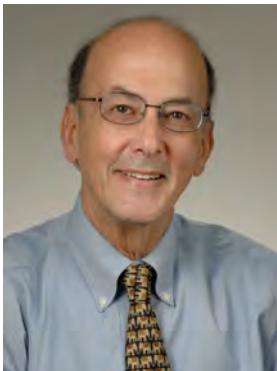
local production and access to essential medical products is being implemented to stimulate innovation and provide technical assistance. National policymakers can also establish preferential procurement of domestically manufactured medical devices to increase demand for home-grown products.

“African governments can play a leading role in encouraging the development of their domestic medical device industries,” the authors said, “not only by establishing medical device regulations and providing adequate resources for their implementation, but also through broader policy considerations.”

# OPINION

By Dr. Roger I. Glass, Director, Fogarty International Center

## Celebrating 30 years of capacity building in Rakai



A paper published by a group of Ugandan researchers in October 1985 described a mysterious illness, called “slim disease,” which had killed 100 people in the country’s Rakai district. It was a seminal moment that awoke the world to the looming HIV/AIDS crisis. The investigations begun then have grown into the Rakai Health Sciences Program,

which is marking its 30th anniversary this year. For Fogarty, it's a wonderful opportunity to celebrate three decades of research capacity building that have resulted in numerous groundbreaking scientific discoveries.

The idea that our small center could play a vital role in preparing low- and middle-income country scientists for the battle against HIV/AIDS came from Fogarty's Dr. Ken Bridbord. As co-chair of the third International Conference on AIDS, held in Washington D.C. in 1987, it became clear to him that a dramatic response was required that should include a rapid scaling up of scientific capacity in Africa and other places where the death toll was quickly rising. Ken conceived an innovative program consisting of mentored research projects, in addition to formal coursework. The result was the AIDS International Training and Research Program, which supported training for more than 2,000 scientists and clinicians in more than 100 developing countries. The initiative was revised to meet evolving needs and continues today as the Fogarty HIV Research Training Program.

In Rakai, the early years of the epidemic were devastating. An HIV diagnosis was a virtual death sentence, with those effected wandering around listlessly with open sores, being shunned by all. Witnessing such suffering gave researcher Fred Nalugoda chills and he thought he could not go back. Now field director and a principal investigator in Rakai, Nalugoda says public awareness and the availability of treatment have dramatically improved the situation. Another Fogarty alum, Dr. Elioda Tumwesigye, is now Uganda's minister of science and technology. He says without the opportunity to receive advanced training funded by Fogarty, he simply wouldn't be who he is today. That

support helped him reach significant career milestones such as starting the first standing committee on HIV in any African parliament and being selected for his current position.

Virtually the entire leadership team at Rakai has benefited from Fogarty training or research funding. In partnership with Johns Hopkins University, training conducted has run the gamut from lab methodology and bioethics to epidemiology, biostatistics and pathology. That laid the groundwork for this small but mighty team to make scientific contributions detailed in a whopping 573 publications, on the implications of circumcision on HIV transmission prevention and numerous other important issues. Those articles have been cited more than 20,000 times, clearly demonstrating the findings' significance.

Today, Rakai is engaged in about a dozen NIH-funded research projects, devoted to pressing issues such as how to improve prevention and treatment among adolescents, and ways to make better use of mobile technologies. But even as we review these incredible accomplishments, we must not rest on our laurels. Much still remains to be done. For instance, it is my hope that the Rakai grants, which are managed by Hopkins, will someday transition to directly fund the Ugandan research leaders themselves. A trove of data and specimens have been collected. We must make sure it is thoroughly mined so we can all learn from these decades-long studies of this population that was so greatly impacted by the epidemic. Over the next decade, it's my hope that the Rakai team will not only continue to gain control of the epidemic and improve treatment for those living with HIV, but will also continue to branch out to other pressing issues such as noncommunicable diseases, and maternal and child health. They must carry on strengthening training resources so they can adequately prepare the next generation of scientists. By bringing in new partners, they may expand south-south partnerships and ensure sustainability of all that has been achieved.

We owe this small community of committed researchers a debt of gratitude for all the knowledge they have given us, from their post on the front lines of this terrible scourge. Paraphrasing Sir Winston Churchill, never was so much owed by so many to so few!



### Former NLM Director Lindberg dies

Dr. Donald A.B. Lindberg, who directed NIH's National Library of Medicine (NLM) for 31 years until his retirement in 2015, has died. A pioneer in computers and medicine, Lindberg's tenure included the creation of NLM's National Center for Biotechnology Information and launch of online resources such as PubMed, ClinicalTrials.gov and MedlinePlus.



### Environmental health director Birnbaum retiring

Dr. Linda S. Birnbaum is retiring after nearly 40 years as a federal scientist, the last 10 leading NIH's National Institute of Environmental Health Sciences (NIEHS) and the National Toxicology Program. Birnbaum is the first board-certified toxicologist and the first woman to direct NIEHS.



### Tucci to lead deafness institute

Dr. Debara L. Tucci has been selected to lead the NIH's National Institute on Deafness and Other Communication Disorders (NIDCD). Previously, she was surgery professor and director of the cochlear implant program at Duke University. Tucci will remain co-chair of the Lancet Commission on Global Hearing Loss.



### New global health head for NIH neurological institute

NIH's National Institute of Neurological Disorders and Stroke (NINDS) has tapped Dr. Richard Benson as director of its Office of Global Health and Health Disparities. Benson was an associate medical director at Medstar Washington Hospital Center and faculty member of the NIH vascular neurology fellowship program.



### Byanyima chosen to lead UNAIDS

Winnie Byanyima is the new executive director of the Joint United Nations Programme on HIV/AIDS (UNAIDS). She previously led Oxfam International, the global organization addressing the injustice of poverty. Trained as an aeronautical engineer, Byanyima's experience as a champion for women and marginalized communities began 30 years ago as member of Uganda's parliament.



### Rotimi recognized for human genetics research

The American Society of Human Genetics has honored Dr. Charles Rotimi for his outstanding scientific achievements during the past decade. A genetic epidemiologist and senior investigator with NIH's National Human Genome Research Institute, Rotimi's lab discovered African-specific variants for diabetes, obesity, lipids and metabolic syndrome.



### Ramsay among distinguished women researchers

Dr. Michele Ramsay received a 2019 South African Women in Science Award in the category of natural and engineering sciences. A professor of human genetics at the University of the Witwatersrand, Ramsay has held a Fogarty research training grant for noncommunicable diseases and is part of the NIH-supported Human Heredity and Health in Africa (H3Africa) initiative.

### NIH Director publishes innovation forecast

Ten promising areas for biomedical innovation are highlighted in a book chapter authored by NIH Director Dr. Francis S. Collins. Part of the Global Innovation Index 2019 report, Collins describes the most exciting areas of science that might yield "striking progress" in the next decade.  
Full report: <http://bit.ly/NIHInnovation>

### Child Health launches strategic plan

Global health was one of five cross-cutting topics identified in the NIH's National Institute of Child Health and Human Development's new strategic plan. Priorities include research to improve health of at-risk mothers and children, and exploration of new technologies.

Full plan: <http://bit.ly/NICHDplan>

### Mental Health unveils research toolbox

The NIH's National Institute of Mental Health (NIMH) recently developed a Clinical Research Toolbox designed to assist clinical investigators with the development of clinical research studies. It includes NIH and NIMH policy documents, sample forms and other resources.  
Website: <http://bit.ly/NIMHtools>

### WHO reports on HIV drug resistance

The rise in antimicrobial resistance—including the threat posed by drug-resistant HIV—is one of the greatest challenges in global health, according to the WHO. Its latest report shows that in 12 of the countries reporting data, pretreatment HIV drug resistance exceeded 10%.

Full report: [http://bit.ly/WHO\\_HIV](http://bit.ly/WHO_HIV)

### Report says better nutrition saves lives

A stronger focus on improving global nutrition could save 3.7 million lives globally by 2025, according to a new WHO report. While childhood stunting has declined, the prevalence of obesity is on the rise in nearly every region and country. The Essential Nutrition Actions publication provides a tool for countries to improve their health policies.  
Full report: [http://bit.ly/nutrition\\_WHO](http://bit.ly/nutrition_WHO)

### Global pandemic preparedness lacking

Despite the risk of widespread epidemics, many countries are not ready to respond in a crisis, according to the inaugural report of the Global Preparedness Monitoring Board. About 59 countries have action plans but none has been fully funded.  
Full report: <http://bit.ly/GlobalPMB>

Funding Opportunity Announcement	Details	Deadline
Noncommunicable Diseases and Disorders Research Training Programs in LMICs D43 Clinical Trial Optional	<a href="http://bit.ly/NCDtrain">http://bit.ly/NCDtrain</a>	Nov 12, 2019
Reducing Stigma to Improve HIV/AIDS Prevention, Treatment and Care in LMICs R21 Clinical Trial Optional	<a href="http://bit.ly/NIHstigmahiv">http://bit.ly/NIHstigmahiv</a>	Nov 12, 2019
Global Infectious Disease (GID) Research Training Program D71 Clinical Trials Not Allowed	<a href="http://bit.ly/IDtraining">http://bit.ly/IDtraining</a>	Nov 12, 2019
Mobile Health: Technology and Outcomes in LMICs R21/R33 - Clinical Trial Optional – non-AIDS applications	<a href="http://bit.ly/NIHmhealth">http://bit.ly/NIHmhealth</a>	Nov 19, 2019
Ecology and Evolution of Infectious Diseases Initiative (EEID) R01	<a href="http://bit.ly/EEIDNIH">http://bit.ly/EEIDNIH</a>	Nov 20, 2019
African Postdoctoral Training Initiative (APTI)	<a href="http://bit.ly/NIHAfricanPostdoc">http://bit.ly/NIHAfricanPostdoc</a>	Dec 1, 2019
Mobile Health: Technology and Outcomes in LMICs R21/R33 - Clinical Trial Optional – AIDS applications	<a href="http://bit.ly/NIHmhealth">http://bit.ly/NIHmhealth</a>	Dec 3, 2019
Heart, Lung, and Blood Comorbidities Implementation Models in People Living with HIV (HLB-SIMPLe) UG3/UH3 Clinical Trial Optional U24 Clinical Trial Not Allowed	<a href="http://bit.ly/hlbsimple">http://bit.ly/hlbsimple</a> <a href="http://bit.ly/hlbsimple-center">http://bit.ly/hlbsimple-center</a>	Dec 10, 2019
Global Noncommunicable Diseases and Injury Research R21 Clinical Trial Optional	<a href="http://bit.ly/NIHncds">http://bit.ly/NIHncds</a>	Dec 13, 2019

For more information, visit [www.fic.nih.gov/funding](http://www.fic.nih.gov/funding)

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Fogarty International Center  
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Managing editor: Ann Puderbaugh  
Ann.Puderbaugh@nih.gov

Web manager: Anna Pruitt Ellis  
Anna.Ellis@nih.gov

Writer/editor: Shana Potash

Designer: Carla Conway

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## WHO calls for more research into microplastics pollution



The WHO has released an assessment on microplastics in drinking water that suggests current levels aren't a human health risk but more studies are needed. The report examines the evidence related to the occurrence of microplastics in both tap and bottled drinking water, the potential health impacts, and the removal of microplastics during wastewater and drinking-water treatment.

Researchers should undertake targeted, well-designed and quality-controlled investigations to better understand the occurrence of microplastics in the water supply chain and their health effects under relevant exposure scenarios, according to the WHO.

### RESOURCES

Full report: <http://bit.ly/WHOplastics>

# The Disaster Research Center at the University of Delaware:

## The World's First Center for the Social Scientific Study of Disaster

Zachary Cox, *Disaster Science and Management, Biden School of Public Policy and Administration, University of Delaware*

James Kendra, Ph.D., *Director, Disaster Research Center; Professor, Biden School of Public Policy and Administration; University of Delaware*

Tricia Wachtendorf, *Director, Disaster Research Center; Professor, Department of Sociology and Criminal Justice, University of Delaware*

Valerie Marlowe, *Assistant Director, Archives and Collections, Disaster Research Center, University of Delaware*

### ABSTRACT

The Disaster Research Center (DRC) was founded in 1963 to help American government decision makers understand how citizens would respond in times of crisis. Since then, DRC personnel have embarked upon some 700 quick-response deployments to better understand the social and physical aspects of disaster mitigation, preparedness, response and recovery. This research has taken DRC faculty and students around the world, from New York City, conducting research that explored and documented the city's response to and recovery from 9/11, to the Kathmandu Valley to better understand mothering during disaster evacuation after the 2015 Nepal Earthquake. Relevant to the academy, practitioners, and the public, DRC is available to lend its expertise to answer the most pressing questions in disaster science.

The Soviet Union's attempted installation of nuclear missiles in Cuba in 1962, and the crisis that ensued, alerted American political and military leaders of the need to understand how people would respond to an atomic attack. U.S. officials believed there would be widespread panic and disorder, but would there be? How would people react to such stress? What, then, should disaster plans contain for dealing with human behavior?

The Disaster Research Center (DRC) was born, in part, to remedy the lack of knowledge needed for valid disaster planning.<sup>1</sup> Through an initial contract from the Office of Civil Defense in the early 1960s, a trio of sociology professors at The Ohio State University furthered the creation of the modern field of disaster research. Professors Russell Dynes, Ph.D., Enrico Quarantelli, Ph.D., and Eugene Haas, Ph.D. aimed at understanding how peacetime disasters might give insight into collective behavior that could be analogized to the behavior that would be seen during a war.<sup>2</sup> However, their original goal was rapidly subsumed by another: understanding the reality of human behavior in disaster, through rigorous scientific methods, and setting aside rumors, folk wisdom, and suppositions. Disaster planning could only be reliable if it was grounded in actual science. DRC moved to the College of Arts and Sciences at the University of Delaware (UD) in 1985. Its mission is to support disaster researchers worldwide by creating, gathering, and disseminating disaster knowledge in a dynamic and responsive way. While the focus of studies has changed over the years, faculty and graduate students still use the original techniques to explore research topics ranging from community resilience to epidemiology. The main goal remains the same: to provide the basis for decision makers to act on the best available knowledge.

### HISTORY AND EVOLUTION OF THE DISASTER RESEARCH CENTER

DRC has focused on fieldwork since its inception. Because hazards like hurricanes, earthquakes, or pandemics become disasters only when they interact with vulnerable systems,

people, or places,<sup>3</sup> it is important for researchers to get on the ground quickly to observe the disruption. Drawing on the tradition of field ethnography in urban sociology, and knowing the importance of field studies during crisis, DRC developed a methodology of quick response research unique to the social sciences that had researchers monitor the news cycle and be ready to deploy.<sup>4</sup>

### NOTABLE FIELD DEPLOYMENTS

DRC conducted one of its first field studies in the aftermath of the 1964 Alaskan earthquake. The 9.2 magnitude earthquake and subsequent tsunami resulted in over 100 fatalities as well as widespread destruction of homes, businesses, ports, and other infrastructure that were ill prepared for such a devastating event. A contingent of five researchers deployed to the scene, arriving a day after the earthquake, to enhance the United States' scientific understanding of the earthquake and disaster response so the country might better prepare for, respond to, and recover from future disasters.<sup>5</sup> Through five site visits to Anchorage between March 1964 (a day after the earthquake) and August 1965, the research team conducted an in-depth study that provided some of the first modern insight into how municipal organizations adapted to the post-disaster environment and recovered.<sup>6</sup> The Anchorage Fire Department, for example, needed to update their processes and capacity to help manage new environmental risks posed by the expansion of the Anchorage port.

Fast forward nearly four decades later. With DRC's proximity to New York City, a team deployed two days following the September 11, 2001 attacks, first for early reconnaissance lasting two months, and later returning for an in-depth study and interviews. This required leveraging connections with local emergency managers to gain permission to attend meetings at the incident command posts and at the emergency operations center, and to shadow personnel. Research methods involved both informal and

formal interviews, observation, photography, and the review of documents such as situation reports, site maps, and procedural instructions. Owing to this intensive 9/11 fieldwork, the DRC's E. L. Quarantelli Resource Collection has over 500 photographs, volumes of notes, and many sketched out maps of buildings and response areas. This research greatly enhanced the scientific understanding of organizational resilience on the part of the New York City Office of Emergency Management,<sup>7</sup> evacuation from Manhattan by boat,<sup>8,31</sup> and creativity from emergency managers to adapt to rapidly changing circumstances.<sup>9</sup> Such perishable data would have been lost if researchers were not present to observe what was going right and what was going wrong. Researchers identified the importance of improvisation and creativity in disaster response; the conditions under which spontaneous volunteers can be most effective (e.g., having useful skills and the ability to work unsupervised); and the value of distributed networks in disasters that overwhelm existing systems (nobody can have the "big picture").<sup>32</sup> They also observed the importance of suspending rules that do not work ("rule breaking with vigilance") and leadership approaches that devolve decisions and support subordinates taking reasonable steps to solve problems.

Other field-based research has provided valuable correctives to media reports of post-disaster behavior in affected areas. In the aftermath of Hurricane Katrina in 2005, DRC researchers were on the ground in New Orleans hotels, hospitals, neighborhood groups, shelters, and the Joint Field Office to record the city's response. NBC News wrote that "looters floated garbage cans filled with clothing and jewelry down the street in a dash to grab what they could," and "it's downtown Baghdad."<sup>10</sup> Snopes, a fact-checking website usually known for clear thinking and skepticism, made the unsubstantiated claim that "looting is an unfortunate and largely inevitable result of large-scale disasters."<sup>11</sup> While the stereotype anticipates mass panic and widespread criminal behavior following the devastation of a natural hazard, DRC researchers found that pro-social behaviors – such as rescuing neighbors, sharing food and other supplies with strangers, and offering shelter and transportation assistance – far outnumbered antisocial actions.<sup>12</sup>

Hurricane Katrina taught researchers another lesson. The catastrophic nature of the damage made it more than simply a "bigger disaster."<sup>13,14</sup> Many local officials were unable to engage in their typical roles while attending to the response, given the demands of the event. Most of the immediate built environment and infrastructure were destroyed, and nearby communities were also impacted, destroying local and pre-positioned supplies, rendering communication and transportation extremely challenging, and leaving communities reliant on assistance from farther away than their mutual aid agreements had accounted for.<sup>14</sup> Catastrophes, then, are qualitatively different from disasters, just as disasters are qualitatively different from emergencies.<sup>13</sup> For this reason, response systems cannot be merely enlarged or expanded, or resources simply added. Emergency management officials must be prepared to operate flexibly and creatively through decentralized, emergent and unscripted approaches.

Some research questions are best answered by exploring multiple field sites. To study the experiences of mothers and infants escaping disaster, DRC researchers visited communities in the Kathmandu Valley, Nepal after the 2015 earthquake (*see Figure 1*)<sup>15</sup> and in Fort McMurray, Canada<sup>16</sup> following a devastating

fire. The researchers focused on the challenges of infant feeding in emergencies and learned that safe infant feeding is a paramount food security issue. They concluded that disaster response activities should account for the actual experiences of affected people and not assumptions.

*Figure 1. Daryl Yoder-Bontrager and Samantha Penta survey the damage caused by the 7.8 magnitude April 2015 Nepal Earthquake which killed 8,857 people and caused \$10 billion in damage. They were part of the DRC team dispatched to explore public health issues associated with the disaster and survey the damage to physical infrastructure. Photo Credit: University of Delaware Disaster Research Center.*



## RESEARCH WITH RELEVANCE

DRC has been at the forefront of disaster science since its inception, helping to advance theory and develop tools that enable researchers to understand complex problems. Its namesake typology of organizational change – the DRC Typology<sup>17</sup> – provided a way to make sense of the routine or novel social structures and tasks in which organizations respond and recover. The work of DRC researchers studying business after the 1994 Northridge Earthquake in California determined that the most important feature in business recovery was size, and that other variables like business age and prior experience with disaster had less of an effect.<sup>18</sup> Other research led by DRC's Benigno Aguirre, Ph.D. greatly enhanced the understanding of how people evacuate from building fires.<sup>19</sup>

A major area of study has been resilience, once used as a catch-all term for all things positive in disaster. Resilience has become a key goal worldwide, with many policy statements and disaster plans in the U.S. and elsewhere emphasizing the aspiration toward resilience.<sup>20</sup> DRC researchers were among the first to use observation, data, and modeling to better understand resilience.<sup>21</sup>

Through DRC's most recent endeavor to understand resilience, its researchers embarked on a large interdisciplinary collaborative project with the Bloomberg School of Public Health at Johns Hopkins University, funded by the Centers for Disease Control and Prevention (CDC). The result was the development of a state-of-the-art model: Composite of Post-Event Well-Being (COPEWELL). DRC researchers and their collaborators at John Hopkins transformed resilience from an abstract concept to a theoretically grounded conceptual model. The conceptual model was expressed mathematically in a system dynamics computational environment, generating maps of resilience at the county level across the U.S. COPEWELL allows U.S. counties to better understand their resilience based on a variety of inputs from publicly available data.<sup>22</sup> To make COPEWELL more useful to communities, the team is developing a rubric-based self-assessment toolkit that is grounded in the computational framework and informed by local knowledge and expertise.<sup>23</sup> These rubrics will allow communities to understand their own resilience profiles; to determine where they are strong and where lacking; and to plan needed resilience-enhancing activities.

UD scholars are also interested in understanding and modeling evacuation. Leveraging DRC's interdisciplinary expertise across engineering and the social sciences, researchers investigated how people evacuate from hurricanes from the perspectives of engineering,<sup>24</sup> social science,<sup>25</sup> and public health.<sup>26,27</sup> These studies typically involve an advisory group of federal, state, and non-profit organizations, with whom the information is shared and whose feedback improves the work. More than knowledge for the sake of knowledge, the goal of these efforts is to create solutions that enhance a jurisdiction's ability to conduct an evacuation before disaster can strike.

When it comes to sharing knowledge with academic audiences, DRC's first Handbook of Disaster Research<sup>28</sup> marked a milestone for the field. It synthesized the existing knowledge on a broad range of disaster topics, from gender differences during disasters to community innovation. It offers researchers and practitioners a place to start when conducting literature reviews or when exploring an unfamiliar new topic. The handbook was re-released in 2018 with updated content and an expanded set of topics.

Public outreach dispels misconceptions about human behavior in disaster, which often looms large in the public's imagination. As DRC encourages community engagement that supports disaster risk reduction, scholars frequently make public and classroom presentations and participate in workshops and meetings with leaders of major corporations and agencies. Recently, DRC developed the "DRC It" series, which serves as a source of information presented through animated videos that are accessible to many different audiences. The products tackle key areas, such as why some people do not evacuate from hurricanes. Visit "DRC It" at <https://www.drc.udel.edu/research/drcit>.

In an example of Delaware-focused applied research, DRC partnered with the Delaware Department of Health and Social Services' Division of Long Term Care Residents Protection and the UD School of Nursing to bolster long-term care facilities' emergency preparedness. Initial interviews and focus groups with care providers formed the basis of a two-day workshop where DRC personnel, emergency management officials, and long-term care facility administrators worked together on emergency plans.

## FOSTERING KNOWLEDGE THROUGH THE E. L. QUARANTELLI RESOURCE COLLECTION

DRC's research materials are housed within the Enrico L. Quarantelli Resource Collection, considered the world's most complete collection of disaster-related material, with particular emphasis on rare or otherwise unavailable items, documents, and material related to the social and behavioral science aspects of disasters. The collection holds more than 125,000 archived items collected by other agencies and researchers, and includes archival, artifact, and popular and scholarly material. With records from more than 700 field deployments, the bulk of materials are field research and other original research data, including interview transcripts, surveys, photographs and audio-visual records of disaster events, and supplemental materials collected at disaster sites (e.g. local newspapers, meeting minutes, fliers, and memorabilia). The Center also maintains its own book, monograph, and report series. The E.L. Quarantelli Resource Collection is open to scholars and agencies looking for scientifically grounded information about disaster, mitigation, preparedness, response, and recovery. The collection is housed at 166 Graham Hall, UD, in Newark, Delaware. To schedule a visit, email [elq-resource@udel.edu](mailto:elq-resource@udel.edu).

## COMMITMENT TO EDUCATION

In addition to its research mission, DRC has a strong commitment to education and helped form the interdisciplinary field of disaster science. DRC faculty teach in several UD undergraduate and graduate programs, including the sociology undergraduate concentration in Emergency and Environmental Management; master's and doctoral programs in sociology, public policy, civil and environmental engineering; and epidemiology, which launched this year. All DRC faculty contribute to the Disaster Science and Management master's and doctoral degrees. Nearly 40 affiliated graduate students take on key leadership and project implementation roles including: co-authorships, field deployments, and participation in large externally funded grants from agencies such as the National Science Foundation, the National Institutes of Standards and Technology, and the CDC. Many DRC alumni continue on to tenured faculty appointments; others take on leadership positions in the private, non-profit, and government sectors.

In commemoration of the late Dr. William A. Anderson, who was among the first graduate students hired at DRC, his wife and daughter formed the Bill Anderson Fund in his memory (*see Figure 2*). In 2018, DRC and the University of Delaware became the Flagship Institution for this national effort. The Bill Anderson Fund Flagship is housed within the DRC, and provides mentoring and professional development workshops to historically underrepresented groups in the disaster field.

*Figure 2. Dedicated to the legacy of Bill Anderson, one of DRC's first doctoral students, the Bill Anderson Fund supports African American and other minority students in becoming disaster scholars with the goal of increasing diversity in disaster science so that the field is more representative of American society.*  
Photo credit: University of Delaware Disaster Research Center.



## LOOKING AHEAD

DRC's four generations of faculty, staff, and alumni have been integral to the development of a field that sees disasters as social problems that need interdisciplinary solutions. As DRC approaches its 60<sup>th</sup> anniversary, it is poised to tackle the grand challenges of disaster,<sup>30</sup> believing that disaster management is only improved by partnering with science, and that those in the disaster science field must seek to improve peoples' lives.

For more information about this exciting work, or to explore ways to support or become involved with DRC, visit [drc.udel.edu](http://drc.udel.edu).

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## Wellness and Prevention Digest

- The [\*\*Editor's Podcast\*\*](#) from the Journal of Public Health Management and Practice highlighted an article from TFAH President and CEO John Auerbach, entitled [\*\*Social Determinants of Health Can Only Be Addressed by a Multisector Spectrum of Activities\*\*](#) (subscription required). Auerbach discussed the need for innovative and collaborative approaches to face this issue.
- The most recent [\*\*Centers for Disease Control and Prevention \(CDC\) Morbidity and Mortality Weekly Report\*\*](#) focuses on e-cigarette use and vaping among persons with associated lung injury in Utah from April to October of this year. The report found that almost all patients reported using tetrahydrocannabinol (THC)-containing vaping cartridges.
- HHS's Office of Disease Prevention and Health Promotion held the Healthy Aging Regional Workshop in Boston last month. An [\*\*executive summary\*\*](#) and [\*\*final report\*\*](#) are now available with details from the meeting.
- The National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) at CDC has published the [\*\*NCCDPHP Program Evaluation collection\*\*](#), a series ten articles from Preventing Chronic Disease that offer insights into the development, implementation, and evaluation of population-based interventions to prevent chronic diseases and to control their effects on quality of life, morbidity, and mortality.
- Health Affairs has recently published two blog posts:
  - [\*\*Exploring The Relationship Between Social And Medical Service Spending\*\*](#) analyzes how the United States compares to other nations on the titular issue.
  - [\*\*Five Insights From The First Five Years Of Research On Building A Culture of Health\*\*](#) discusses the findings from the Robert Wood Johnson Foundation Culture of Health initiative

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F (202) 223-9871  
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# When it Comes to Disaster Preparedness, Local Innovation Equals Global Resilience

Joshua L. Kelly, C.E.M.

Planning Supervisor, Long-Term Recovery Program Manager, Delaware Emergency Management Agency; Planning Section Chief, State Emergency Operations Center Activations

## ABSTRACT

Throughout the United States, cities are building risk-reduction programs by working with non-traditional and non-governmental entities. Traditionally, such partnerships formed at the local intra-governmental level. The Hyogo Framework of 2005 initially promoted multi-stakeholder partnerships as a worldwide disaster risk reduction strategy.<sup>3</sup> In 2015, the United Nations adopted the 2015-2030 Sendai Framework for Disaster Risk Reduction.<sup>4</sup> One of its guiding principles is risk reduction and management through cross-sectional collaboration. In the last decade, Delaware, New Orleans, Portland, San Francisco, and New York have done an exceptional job of pushing the boundaries for American risk reduction efforts through novel partnerships.

## NEW ORLEANS, LOUISIANA - EVACUTEERS

New Orleans' Evacuteer program<sup>5</sup> is not necessarily new, as it's been around since 2009, but it is still one of the best examples of integrating public art into a disaster preparedness program (*see Figure 1*). According to the program's website, "Evacuteer.org recruits, trains, and manages evacuation volunteers (Evacuteers) who assist with New Orleans' public evacuation option called City Assisted Evacuation (CAE). CAE activates when a mandatory evacuation is called, and is designed to move 35,000-40,000 New Orleanais without a safe or alternative option to evacuate."



Figure 1. The Evacuteer Program. Credit: <https://evacuteer.org>

The Evacuteers placed 17 14-foot tall statues at pre-determined evacuation points known as "Evacuspots." The Arts Council of New Orleans and the New Orleans Office of Homeland Security and Emergency Preparedness (NOHSEP) installed these statues in high-risk neighborhoods so that residents without personal vehicles can meet there for evacuation by mass transit. The program utilizes volunteers and community partners to advertise and staff the Evacuspots. They organize outreach events like their "Bye Bye Hurricane Season" party (which marks the beginning and end of each hurricane season) and stage volunteers at Union Terminal for out-of-town connections and at City Hall to assist with the City's 3-1-1 network.

Fortunately, there has not been the need for another evacuation at the scale of Hurricane Katrina. The Evacuteers have done a phenomenal job at utilizing art and a very New Orleans-style community engagement strategy to get their message into the community. They improve the program through innovative outreach efforts like their current Love, Write, Light project.

## PORTLAND, OREGON - AIRBNB

In 2015, The New Yorker magazine published the article, "The Really Big One" by Kathryn Schulz that achieved viral status.<sup>6</sup> Her composition created such a nationwide run on earthquake preparedness kits that it warranted a follow-up article, "How to Stay Safe When the Big One Comes," and evoked endless social media commentary.<sup>7</sup>

Emergency managers always appreciate when families become more prepared. However, they realize that a catastrophic event like a major earthquake or Hurricane Dorian's devastation in the Bahamas would be incredibly complex to manage. It would also be devastating for any city and emotionally and mentally taxing for those being sheltered.<sup>1</sup> A dispersed community sheltering model supplements traditional shelters, such as a gymnasium filled with cots, with peer-to-peer room rental services, like Airbnb, Inc., which arranges lodging online. In July 2014, Portland officials were one of the first communities to sign a Memorandum of Understanding (MOU) with Airbnb, Inc. to activate its service in Portland during a declared disaster.

Airbnb will automatically notify users who have signed up as disaster response hosts, waive Airbnb's normal booking fees, and put out an all-call to users in the area.<sup>8</sup> This dispersed sheltering method was proven as a viable concept during Superstorm Sandy, when 1,400 hosts first participated in Airbnb's Open Homes program.<sup>9</sup> In addition to the physical benefits of dispersed sheltering, the Sandy rollout showed Airbnb's potential to cash in on post-disaster altruism, sometimes referred to as the therapeutic community,<sup>2</sup> while connecting neighbors who were willing to help those in need of shelter. According to Shell, an Airbnb host from Clinton Hill, NY during Hurricane Sandy, "Sometimes people don't connect that much in New York, and you can feel isolated. Inviting guests in during Hurricane Sandy brought a sense of community right into my home."<sup>10</sup> According

to a 2014 study, Airbnb generated \$61 million in economic activity, in a twelve-month span from February 2013-January 2014, in Portland and helped support 660 local jobs.<sup>11</sup> This is a great example of how a city and the private sector can leverage a common goal into a win-win situation for the community.

## SAN FRANCISCO, CALIFORNIA - SF72

So many disaster preparedness websites exist that they tend to bleed together after a while. While these are fitting for many communities, they are not appropriate for every community, especially where a large portion of the target population cannot be reached online.

To reach its tech-savvy Millennials, the San Francisco Department of Emergency Management designed a sleek and user-friendly disaster preparedness website around a very simple message: “You are More Prepared than You Think” on SF72.<sup>12</sup> The majority of the site is dedicated towards identifying and using everyday items that can also come in handy during an emergency. Accessing NextDoor.com, stocking board games, and repurposing a grill are a few of the more unique suggestions. As if SF72’s slick design was not innovative enough for an emergency preparedness site, its more impressive features are the open source toolkit, personal stories, and a blog. SF72’s content is open and available for use by other emergency preparedness organizations and non-profit agencies and is one of the most innovative emergency preparedness sites in the world.

## NEW YORK, NEW YORK - REBUILD BY DESIGN

Following Hurricane Irene in 2011 and Hurricane Sandy in 2012, the U.S. Department of Housing and Urban Development (HUD) launched a design competition in New York. HUD used its Community Development Block Grant Disaster Recovery Program and called the competition “Rebuild by Design” (*see Figure 2*).<sup>13</sup>



Figure 2. Rebuild by Design. Photo Credit: [www.rebuildbydesign.org](http://www.rebuildbydesign.org)

“Rebuild by Design is pioneering new ways to design, fund, and implement a resilient future,” the program’s website states. “Launched by HUD in the wake of Hurricane Sandy, Rebuild by Design marshals the world’s greatest talents to answer a region’s greatest needs, while placing civic leaders and communities at the heart of the design process. Its method maximizes inter-agency communication and cross-sector communication, and delivers innovative, implementable, large-scale infrastructural solutions that embody a people’s unique vision of their own

resilient future.” Since the program’s initial round closed in 2013, six projects were funded in New York City by the initial \$930 million federal commitment, received funding, and are scheduled to break ground by early 2020. Meanwhile, the Rebuild by Design organization promotes the projects and engages the community through outreach efforts.

Programs that build disaster resilience and preparedness come in many forms. What works for one location may not work in another. However, what matters most is that a message or program targets its population efficiently. Delaware is doing just that through the preparedness website, [PrepareDE.org](http://PrepareDE.org), created by the Division of Public Health and the Delaware Emergency Management Agency, and Delaware Citizens Corps.<sup>14</sup> Delaware’s communities should look towards like-minded organizations for inspiration when developing disaster risk programs. One innovation at a time, they can move the state and, ultimately the world, toward the 2015 Sendai framework’s goal of a more resilient humanity.

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# Super Storm Sandy: What We Learned

Timothy R. Cooper, M.A., C.E.M., Director, Office of Preparedness, Delaware Division of Public Health  
Rick Hong, M.D., Medical Director, Office of Preparedness and Division of Public Health

## ABSTRACT

On October 22, 2012, a tropical depression formed off the northeast coast of Nicaragua in the Caribbean Sea. Two days later, it strengthened and became a Category 1 hurricane while traveling northeast, passing over Jamaica, the Dominican Republic, and Haiti, and continuing over Puerto Rico and Cuba by October 26. Over the next few days, the hurricane continued north but weakened to a tropical depression once reaching the Bahamas. However, it quickly progressed into a Category 1 hurricane once again due to warm waters and expanded to a radius of 100 miles.<sup>1</sup>

The storm continued to progress up the U.S. East Coast but stayed several hundred miles offshore when passing the Carolinas, pushing large waves and massive amounts of rain ashore. It moved past Delaware and New Jersey as a post-tropical cyclone, causing more damage as it struck a cold front heading east toward the Atlantic. Another high-pressure storm to the north trapped it along the shore, extending winds over 70 mph up to a thousand miles. It coincided with high tide north of New Jersey to Connecticut, resulting in record tide levels.<sup>2</sup>

## INTRODUCTION

Described as a “raging freak of nature” by National Geographic,<sup>3</sup> Super Storm Sandy, a hurricane of unprecedented size and strength, was forecasted to impact Delaware on October 29, 2012. It caused deadly flooding, mudslides, and destructive winds from the Caribbean to the U.S. East Coast due to an unusual combination of hurricane conditions and cold fronts. During the storm’s nine-day course, it killed 70 people in the Caribbean and almost 150 people in the U.S. The National Oceanic and Atmospheric Administration estimates Sandy caused at least \$70 billion in damages,<sup>4</sup> making it among the costliest storms in U.S. history (*see Figure 1*). This natural disaster tested Delaware’s full capabilities in preparedness and response and the partnerships among the Delaware Department of Health and Social Services (DHSS), Division of Public Health (DPH), particularly the Office of Preparedness; the Delaware Emergency Management Agency (DEMA); and other state agencies.



Figure 1. Damage along the New Jersey shore from Hurricane Sandy in 2012.

## MASS CARE AND SUPER STORM SANDY

Sandy powered a glancing blow to Delaware, causing unprecedented flooding in areas that never experienced flood of that magnitude, downed trees, and power outages. Several

community shelters opened based on DEMA’s response, accommodating more than 1,000 residents for three days. Delaware could have fared much worse, based on initial forecasts. Stakeholders involved in the preparedness and response identified a number of important lessons.

DPH’s Emergency Medical Services and Preparedness Section (EMSPS) made several improvements. It developed new training that addresses gaps in preparedness and response; purchased new equipment to meet additional shelter client needs, and internally, made structural changes to the Incident Command System for a more effective functional structure during response and recovery. Quick action guides and checklists were developed to assist responders understanding of their roles in supporting DPH’s State Health Operations Center (SHOC), an internal emergency response structure.

Several other changes revolved around supporting vulnerable populations during a disaster. EMSPS created a new SHOC response position, Vulnerable Populations Coordinator, to support the needs of people with disabilities, particularly in a disaster. It also established a new SHOC unit group known as the Functional Information and Support Center (FISC). FISC consists of staff from DPH and other DHSS divisions, and community organizations to offer resources and technology for those with Access and Functional Needs (AFNs).

In addition to improvements in the state’s AFNs response, EMSPS launched several preparedness planning initiatives for that population, including creating a planning group to focus on AFNs mass care. The AFNs Planning Group suggested designing a system to assist those with AFNs during emergencies, and following the super storm, developed mitigation strategies to improve the preparedness and response capabilities for people with disabilities. One of the group’s activities was developing the Preparedness Buddy emergency planning brochure, available on the DPH website in seven languages.<sup>5</sup>

DPH also launched a multi-year planning and exercise project that improved mass care capabilities within the state for persons with AFNs and led to the development of several new Mass Care plans to address shelter roles and responsibilities. The

new planning process also led to improvements in training, equipment, and staffing. For example, DPH purchased Shelter Communication Packages to improve communications of providers working at the shelters with those who have AFNs. DHSS also partnered with DEMA and the American Red Cross (ARC) to train shelter managers on general shelter operations and maintenance, while DPH enhanced its shelter training for DHSS and Delaware Medical Reserve Corp nurses. Lastly, DPH created a new position, the Shelter Technician, who assists nursing staff at shelter medical stations, with safe patient handling, registration, logistics, and communications for persons with AFNs.

In 2018, DHSS conducted a full-scale shelter exercise in Sussex County to test its ability to activate a shelter and its newly developed plans and capabilities of trained shelter managers. All DHSS divisions partnered with DEMA, the Delaware Department of Education, the Sussex County Emergency Operations Center, the Delaware National Guard, the Delaware State Police, the Indian River School District, and the ARC.

Although Super Storm Sandy could be considered a “freak of nature,” this event forced DPH and state and local partners to review their plans and procedures and improve their preparedness and response capabilities.

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## MINI TIP

### HOW TO STAY SAFE DURING A POWER OUTAGE

- Before a power outage, add your electric company as a contact on your cell phone and post the number at home. Before reporting a power loss, check the circuit breaker.
- Listen to the news on a battery-powered or hand-cranked NOAA weather radio, TV, or computer. Buy batteries now; [www.PrepareDE.org](http://www.PrepareDE.org) has a supply list.
- To prevent fire during a power outage, use flashlights and battery-operated lanterns, not candles.
- To stay warm indoors during a winter power outage, dress warmly in layers (long sleeved t-shirts and sweaters and/or sweatshirts and jackets), wear a hat to trap heat, and wear gloves as well.
- Never use kerosene heaters, grills, outdoor heaters, or generators inside the home or garage. Carbon monoxide poisoning causes serious illness and can be fatal.
- Avoid opening the refrigerator and freezer.
- Bring pets inside during hazardous weather events and extreme cold.

If a power outage continues during extreme cold events, it may be necessary to go to a nearby shelter if travel is safe. Before setting out, check shelter availability.

# Get a Plan; Make a Kit

Nicholas Colazzo, M.D. and Douglas Ader, D.O. P.A.-C.  
Emergency Medicine Residents, Christiana Care Health System

## ABSTRACT

A disaster strikes and your employer calls you to help. You cannot be mentally prepared to assist if you are distracted about the safety and well-being of your own family. Follow these four basic tips so you have peace of mind and can do your job.

### 1. Get a Plan

Pre-planning cannot be understated. Think about what types of disasters might strike in your area, and make situation-specific plans. Visit [PrepareDE.org](http://PrepareDE.org) to get started. The website provides information about different types of disasters, such as damaging storms, flooding, severe heat or cold events, chemical leaks, and terrorist attacks. [PrepareDE.org](http://PrepareDE.org) provides communication plan templates for parents and a separate one for children, commuters, pets, and evacuations. Most importantly, practice your plan.

**Family Communication Plan**

**Important Information**

Fill in this information and keep a copy in a safe place, such as your purse or briefcase, your car, your office, and your disaster kit. Be sure to look it over every year and keep it up to date.

**Out-of-Town Contact**

Name: \_\_\_\_\_  
Home: \_\_\_\_\_  
Cell: \_\_\_\_\_  
Email: \_\_\_\_\_  
Facebook: \_\_\_\_\_  
Twitter: \_\_\_\_\_

**Work Information**

Workplace: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Facebook: \_\_\_\_\_  
Twitter: \_\_\_\_\_  
Evacuation Location: \_\_\_\_\_

**Know the Numbers!**

Home: \_\_\_\_\_ Adult: \_\_\_\_\_  
Parent: \_\_\_\_\_ Home: \_\_\_\_\_  
Cell: \_\_\_\_\_ Cell: \_\_\_\_\_  
Work: \_\_\_\_\_ Neighbor: \_\_\_\_\_  
Parent: \_\_\_\_\_ Home: \_\_\_\_\_  
Cell: \_\_\_\_\_ Cell: \_\_\_\_\_  
Work: \_\_\_\_\_ Neighbor: \_\_\_\_\_  
My cell: \_\_\_\_\_ Home: \_\_\_\_\_  
Sibling: \_\_\_\_\_ Cell: \_\_\_\_\_  
Sibling: \_\_\_\_\_ Home: \_\_\_\_\_  
Cell: \_\_\_\_\_ Cell: \_\_\_\_\_

**Memorize your home and parents' cell phone numbers!**

Cut this out and keep it somewhere safe like your backpack, school notebook, or wallet. Or input these numbers into your cell phone if you have one.

**BE A HERO!** <http://www.ready.gov/kids>

### 2. Make a Kit

After a major disaster, relief workers will be on the scene, but it may take time for them to arrive at all locations. Families should prepare to take care of all household members for up to three days by making emergency supply kits for home and work, and a "go bag" for the car. For recommended supply lists, visit [Ready.gov](http://Ready.gov) and [PrepareDE.org](http://PrepareDE.org) or use the Federal Emergency Management Agency (FEMA) app.

Household emergency supply kits should contain one gallon of drinking water per person per day, for at least three days; and a three-day supply of non-perishable food per person. Kits should also include a battery-powered or hand-crank powered radio or a NOAA weather radio, flashlights, phone chargers, extra batteries, first aid kit, essential medications, paper products, a can opener, and pet food. Consider buying a generator.

All households, regardless of income, should stock an emergency supply kit. It might be easier to make weekly purchases to build the kit. With the Disaster Supplies calendar (<http://delawarepreparedness.pbworks.com/w/file/126826340/Disaster%20Supplies%20Calendar.docx>) an emergency supply kit can be assembled in small steps over a five-month period. Periodically check the expiration dates of food items and batteries and replace as necessary.

For the office, an emergency supply kit should include a first aid kit, essential medications, a change of work clothing; hygiene items such as a toothbrush and toothpaste, deodorant, and cleansing cloths; and protein bars, canned soup, frozen meals, and drinking water. Also include a cell phone charger and any back-up work equipment or personal items needed in case work hours are unexpectedly extended.

For car emergency supply kits, begin with evacuation route maps pertaining to your residence, work-site, and other places that you visit often. Visit [https://deldot.gov/information/projects/tmt/evac\\_map.shtml](https://deldot.gov/information/projects/tmt/evac_map.shtml) for the Delaware Department of Transportation's evacuation routes by county. Add a first aid kit, essential medications, a cell phone charger, drinking water, and non-perishable snacks such as dried fruit and protein bars; blankets or a sleeping bag, a hat, gloves and scarf; jumper cables, a spare tire, flares, a flashlight, a tow rope, an ice scraper, snow brush, and snow shovel; and a bag of sand or kitty litter.

Protect assets by including copies of homeowner's, health, and life insurance policies. Consider purchasing flood insurance and boat insurance as needed. If you have not yet done so, establish an emergency fund consisting of 10 percent of the wage earner's annual salary. Keep cash in small bills on hand, in case ATMs and banks are closed during an emergency. Safeguard important documents including insurance policies

and for household members, recent photos of family members, birth certificates, social security cards, and medical records by keeping them in an easily movable portable waterproof container or Ziploc® bags.

### 3. Stay Informed

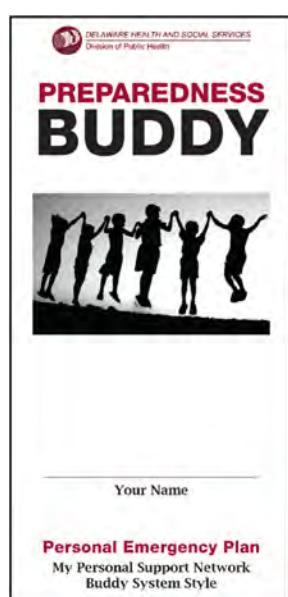
The Delaware Emergency Notification System (DENS) is the primary system for public warning and emergency protective action information in Delaware. The system allows local 911 centers or emergency managers to send messages to the specific street, neighborhood, or larger areas affected by the event. Register for DENS at [PrepareDE.org](http://PrepareDE.org).

In case of an emergency, turn on the radio, television, and cell phone and await news and instructions from public safety officials. Use the cell phone and a NOAA weather radio during power outages.

### 4. Access Resources

Individuals in all occupations can benefit from taking disaster education courses and advanced training, such as these:

- National Incident Management System Training Program, <https://www.fema.gov/national-incident-management-system>
- Emergency Management Institute, <https://training.fema.gov/is/>
- Center for Domestic Preparedness, <https://cdp.dhs.gov>
- National Disaster Life Support Foundation, <https://www.ndlsf.org>.



Households with individuals with access or functional needs often rely on others for assistance. Help them prepare by identifying a Preparedness Buddy, and then complete the "Preparedness Buddy" brochure to develop a personal emergency plan. The Preparedness Buddy brochure can be found online in seven languages at <http://www.dhss.delaware.gov/dhss/dph/php/preparednessbuddy.html>.

Individuals who want to promote preparedness or volunteer for state emergencies should contact the Delaware Medical Reserve

Corps at <https://sites.udel.edu/delawaremrc/>. Federal-level organizations managed by the National Disaster Medical System provide assistance for large-scale disasters and volunteers can be deployed for up to 14 days at a time. Consider registering early with the Emergency System for

Advance of Volunteer Health Professionals at <https://www.phe.gov/esarvh/Pages/default.aspx>.

The Division of Public Health (DPH) provides this additional advice:

#### *Food Safety*

During power outages, DPH advises to be very cautious with refrigerated foods. Keeping refrigerator and freezer doors closed as much as possible will keep food cold for about four hours. A full freezer will keep the temperature for approximately 48 hours (24 hours if it is half full) if the door remains closed. Discard any perishable food (such as meat, poultry, fish, eggs, or leftovers) that has been above 40 degrees Fahrenheit for two or more hours. Cook properly chilled or frozen meat, poultry, fish, or eggs thoroughly to the proper temperature to kill bacteria. Do not eat any food that contacted flood water, and discard canned foods with swelling, leakage, punctures, holes, fractures, extensive deep rusting, or dents that prevent normal stacking or opening.

#### *Drinking Water Safety*

Ensure a supply of water for sanitary purposes such as cleaning and flushing toilets. Fill the bathtub and other large containers with water. FEMA recommends stocking one gallon of water per person per day for at least three days, for drinking and sanitation. If advised to boil drinking water, heat water at the highest possible temperature so that it bubbles constantly (a rolling boil). Continue to boil water for one minute, and then let it cool. Store in clean, covered containers. Residents can also disinfect water using household bleach. Add 1/8 teaspoon (or 8 drops) of regular, unscented, liquid household bleach for each gallon of water. Stir it well and let it stand for 30 minutes before using it. Bottled water is another safe alternative.

For bottle feeding infants, use prepared, canned baby formula that requires no added water. When using concentrated or powdered formulas, prepare with bottled water if the local tap water source is potentially contaminated. Wash fruits and vegetables with water from a safe source before eating.

For information on safe drinking water, visit the DPH website at <http://www.dhss.delaware.gov/dhss/dph/hsp/i-floodrecovery.html>.

#### *Avoid Carbon Monoxide*

A common source of fatalities during and after storms is carbon monoxide (CO) poisoning. CO is an odorless, colorless gas that is released from gasoline-powered generators, camp stoves, grills, lanterns and charcoal-burning devices that are designed for outdoor use only. Never use outdoor equipment inside and always ensure that any outside use is well ventilated.

Being prepared often brings peace of mind and a sense of assuredness. It may also prevent injury and save lives.

[Additional Resources selected by the authors here.](#)

# Emergency Plans should be in place for seniors and people with access and functional needs

April A. Cleveland, Ph.D., Trainer/educator, Office of Preparedness, Division of Public Health

Beth MacDonald, Vulnerable Populations Coordinator, Office of Preparedness, Division of Public Health

Advanced emergency preparations are critical for persons with access and functional needs because they need assistance when incidents occur. It is less stressful for them, their families, and their caregivers when emergency plans are in place. Persons with access and functional needs, which may consist of a variety of visual, hearing, mobility, cognitive, emotional, mental, and language limitations, are found frequently in the older and pediatric populations, may result from belonging to differing cultures, and may include those with medical fragility or chemical dependence. Any of these individuals may have challenges with independence, communication, transportation, self-supervision, and medical care before, during, and after an incident.

That's why it is important for these individuals to engage in pre-planning. For instance, it is important to determine what to do in case of interrupted utilities (electricity, gas, phone, and garbage disposal). Those who rely on oxygen and ventilators need back-up plans in case power failures occur. Delawareans also need to think ahead about how to overcome interrupted transportation (medication deliveries, transportation to and from work, and caregiver and family visits). Individuals on medication should get their prescriptions filled promptly, especially if bad weather is approaching, as shelters do not supply medicine, oxygen, ventilators, or hearing aids.

Sometimes, persons with access and functional needs are not able to complete this planning on their own. The Division of Public Health's (DPH) Office of Preparedness advises Delawareans who live alone or have access and functional needs to ask someone dependable to serve as their preparedness buddy, and identify someone else to be an alternate buddy. These individuals serve important support functions both before and during an emergency.

It is recommended that individuals and their designated buddies complete the Preparedness Buddy personal emergency plan brochure before a crisis occurs. The fillable form provides a step-by-step template to complete an emergency plan using a personal support network, or buddy system. The Delaware Access and Functional Needs Committee (Delaware AFN) and disability partners developed the brochure, which is available in seven languages. Find the Preparedness Buddy brochure at <http://www.dhss.delaware.gov/dhss/dph/php/preparednessbuddy.html>.

Preparedness buddies review and update emergency plans each year or during peak disaster seasons. The original emergency plan should be kept in the person's disaster kit, while copies should be shared with the preparedness buddy, an alternate buddy, and caregivers. They should also regularly check on their designated buddies to ensure they have adequate medications, oxygen and medical supplies, food, and water.

Home health care agencies are required by law to have preparedness plans for their clients. Their social workers or nursing agency representatives assist in developing the plans. Delaware Division of Substance Abuse and Mental Health clients receive a Preparedness Buddy brochure at their yearly review; the social

worker completes two copies, one of which remains with the client.

In addition to the Preparedness Buddy brochure and the support provided by Delaware AFN, the Office of Preparedness attends, sponsors, and hosts numerous workshops, health fairs, and conferences that are tailored to the needs of seniors and people with disabilities. The Access and Functional Needs Committee shares outreach information with the Office's Vulnerable Populations Coordinator, who publicizes preparedness events on the PrepareDE Facebook (<https://www.facebook.com/PrepareDE/>) and distributes fliers at local libraries and outreach events.

To improve personal health and safety and emergency preparedness, the Office of Preparedness, Citizens Corp, the Delaware Emergency Management Agency, Independent Resources, and the Modern Maturity Center annually co-host a Community Preparedness Workshop for seniors and people with disabilities. The workshop features technology tools provided by the Delaware Assistive Technology Initiative and community resources, including fire safety and fire extinguisher selection and use, Smart 911™, and Text-to-911. Other shared resources are the File of Life, a magnetized pouch containing medical information that is kept on the refrigerator (see Figure 1), and PulsePoint, a mobile phone application that allows users to view and receive alerts on calls fire departments and emergency medical services are responding to. The CHEER Center in Georgetown asked the Office of Preparedness to provide a similar workshop in Sussex County

in 2020 that provides additional insight on county-specific resources. The Office of Preparedness will hold a Community Preparedness Workshop on February 4, 2020 from 10:00 a.m. to 2:00 p.m. at the CHEER Community Center, located at 20520 Sand Hill Road in Georgetown, Delaware.

Figure 1. File of Life

DPH recommends registering Delawareans with access and functional needs at the Smart911™ website: <https://www.smart911.com>. Smart 911™ is a free service in all three counties that allows residents to create a household Safety Profile for first responders. When a call is placed to 9-1-1 from a phone associated with a person's Safety Profile, the 9-1-1 call taker can view it and provide the appropriate response.

The Office of Preparedness attends numerous community health fairs, as well as the Legislation, Independence, Family, and Education Conference, the Alzheimer's Association Annual Dementia Conference, and the CHEER Senior Center's Annual Beach Day celebration (see Figure 2). In total, the Office of Preparedness strives to provide information and resources to help our most vulnerable populations prepare for and recover from emergencies and disasters.



Figure 2. Family Emergency Preparedness Day 2018. Photo by April Cleveland.

## RESOURCES

American Red Cross, New Castle County Emergency Operations, <http://nccde.org/154/Emergency-Management>

American Red Cross Pillowcase Project, <https://www.redcross.org/about-us/news-and-events/press-release/2018/red-cross-trains-1-million-children-to-prepare-for-disasters-thr.html>

Delaware Department of Health and Social Services, Division of Services for Aging and Adults with Physical Disabilities, Guide to Services for Older Delawareans and Persons with Disabilities, Emergency Preparedness section, <http://www.delawareadrc.com/>, pages 82-84.

Delaware Department of Health and Social Services, Division of Public Health, <http://www.dhss.delaware.gov/dhss/dph/php/preparednessbuddy.html>.

Delaware Emergency Management Agency, [PrepareDE.org](#)

Federal Emergency Management Agency, [Ready.gov](#)

Kent County Emergency Operations, [www.co.kent.de.us/public-safety/emergency-management.aspx](http://www.co.kent.de.us/public-safety/emergency-management.aspx)

Sussex County Emergency Operations, [www.sussexcountyde.gov/emergency-operations-center](http://www.sussexcountyde.gov/emergency-operations-center)

Smart 9-1-1 website, <https://www.smart911.com/>

University of Delaware, Emergency Readiness Planning for Delawareans with Disabilities, [Allreadyde.org](#)

## MINI TIPS

### DESIGNATE A PREPAREDNESS BUDDY TO PROVIDE HELP DURING EMERGENCIES

Emergencies can be less stressful if prior planning has occurred. That is especially true for who may need extra assistance during an emergency, such as adults and children with access and functional needs, seniors, and those with temporary or chronic health conditions, language barriers, and mobility or other issues.

The Preparedness Buddy brochure helps people with access and functional needs prepare. If bad weather is forecasted, preparedness buddies regularly check on their designated buddies to ensure they have enough medication, oxygen, food, and water.

The Division of Public Health urges loved ones or those serving people with access and functional needs to print, fill out, and share the brochure with caregivers. Read the Preparedness Buddy brochure in seven languages at <http://www.dhss.delaware.gov/dhss/dph/php/preparednessbuddy.html>.

## PREPAREDNESS BUDDY

Your Name \_\_\_\_\_

**Personal Emergency Plan**  
My Personal Support Network  
Buddy System Style

## TTY SERVICES

A person who is deaf, hard-of-hearing, deaf-blind or speech-disabled can call State of Delaware phone numbers using TTY services. Dial 7-1-1 or 800-232-5460 to type your conversation to a relay operator, who reads your conversation to a hearing person. The relay operator types the hearing person's spoken words back to the TTY user. To learn more about TTY availability in Delaware, visit <http://delawarerelay.com>.

# Nurses Were Built for the Front Lines

Malikah Taylor, M.P.H., M.S.N., R.N.

*Nurse Consultant, Emergency Medical Services and Preparedness, Division of Public Health*

## ABSTRACT

Increased severity of natural disasters and a rise in man-made disasters have underscored the importance of disaster planning, mitigation, and recovery. Designating and credentialing professionals assigned to protect the health and well-being of the public is a major component in safeguarding the public during and after a disaster. The nursing professional is a subject matter expert in care provision and advocacy in the community. Nurses excel in high stress environments and routinely manage scarce resources making them a natural ally in disaster preparedness and recovery efforts. Disaster education for nurses and home preparedness planning create an eager every-ready responder.

A disaster is an unplanned event that overwhelms a community and results in human, environmental, and economic losses that exceed or threaten available resources. As the rate of natural disasters and the threat of terrorist attacks rise, it has become increasingly important that there be increased focus on disaster planning, mitigation, and recovery. A large portion of this planning includes designating and credentialing professionals who will work to protect the health and well-being of the public during and after a disaster. There is a natural partnership between mass care incidents and the nursing profession. There are over four million nurses throughout the U.S., which are essential to the success of any health care organization.<sup>1</sup> Education, experience in chaos, synergy with ancillary groups, and connection to the community are just a few reasons why nursing is at the foundation of disaster care.

The standard nursing program takes two to four years to complete. Associate degree programs, completed in just two years, have begun aligning with four-year programs in a push to have 80 percent of Bachelor degree nursing candidates prepared by 2020.<sup>2</sup> It is in the halls of academia that nurses learn the fundamentals of what it takes to be a successful nurse, but that is just the tip of the iceberg. After graduation, nurses learn to care for patients throughout the lifespan and illness continuum, as well as the communities they serve. On-the-job training at the hands of experienced professionals with actual patients builds foundational knowledge that naturally sharpens triage and patient teaching skills. The skill of triage and experience with clinical guidelines and protocols are invaluable during mass care incidents (MCI).

A 2018 workforce study reported that 58 percent of registered nurses were employed either in hospitals or in hospital-based organizations.<sup>1</sup> The U.S. health burden and unequal access to health care have led to a significantly disproportionate amount of medical services received in emergency departments and urgent care centers.<sup>3</sup> Nurses are skilled in multi-tasking, adaptation, and prioritization because they swim through a sea of need every day, thriving in chaos. Nurses deliver clinical care, team leadership, creative problem-solving skills, and resource management, as well as develop important communication skills in situations of rapid changes.<sup>4</sup>

These characteristics are crucial in MCIs and community planning activities that affect the health and safety of the public at large, especially during natural or man-made disasters such as Hurricane Sandy, winter storms, and multiple dwelling fires.

Nurses play a vital role in health care, but they cannot do it alone. Health care has a multitude of moving parts working together to produce a common purpose: quality health care.<sup>5</sup> Collaboration is ingrained in nursing practice as the role has stakes in health outcomes in the post-treatment phase of an illness such as hospital readmissions and disease exacerbation.<sup>6</sup> Working relationships with social workers, home care organizations, and community-based care programming are necessary to manage population health. Effective relationships manufacture lasting partnerships based on mutual respect, ownership of roles, and confidence in the greater public health system. Disaster nursing is systematic and adaptable, using clinical knowledge and skills conducted in cooperation with other partners to reduce damages to health and eliminate a disaster's life-threatening hazards.<sup>7</sup> During emergencies, nurses rely heavily on established bonds.

Lastly, nursing has a palpable connection to the community. Nurses have great communication skills, are experienced in educating patients and families, and possess sharp problem-solving abilities to help patients manage their conditions at home. The nurse-patient connection lasts beyond a single health event. The interconnected nature of our society means that although the patient is the focus of the clinical care, the entire family unit and potentially the entire community can learn and benefit from those efforts.<sup>8</sup> As the most trusted health care professional and a masterful advocate, nurses should be the first alliance considered when engaging the public during public health emergencies, natural disasters, or other MCIs.

Nurses are encouraged to lend a hand during a disaster or MCI; there are plenty of ways to get involved. Licensed professionals in Delaware who want to volunteer should volunteer with licensed agencies such as the Delaware Medical Reserve Corps (DMRC) and The American Red Cross. Nurses will work in unfamiliar physical environments during a disaster, but their nursing skills and thoroughly drafted medical protocols will

serve as their guide. Lack of disaster education and training are reasons that health professionals fail to volunteer. Nurses should be equipped with the necessary knowledge and abilities to work in a disaster and to meet the needs in the community; however, few have had previous experience in disaster response.<sup>9</sup> National nurse readiness is critical to improving population health outcomes and protecting patients and families affected by disaster events and are directly related to the health security of the U.S.<sup>10</sup>

The Division of Public Health's Emergency Medical Services and Preparedness Section offers training for professionals who are registered volunteers or have a medical State Health Operations Center (SHOC) role. The Annual Shelter Nurse Training introduces the SHOC, the medical command and control for public health and medical response and recovery functions in an attempt to fill the education and training gap. During these trainings, nurses are presented with potential patient scenarios and conditions and gain experience with the equipment and supplies they will encounter at Shelter Medical Stations (SMS) within State of Delaware Community Shelters. A SMS is a designated area managed by DPH that provides basic medical services and can be expanded to coordinate supportive care during an incident. Hands-on training for specialized life-saving inventions such as respiratory distress and arrest, anaphylaxis, opioid overdose, diabetic emergencies, and hemorrhage control are offered in small rotating skill stations. Simulation of an SMS is constructed to familiarize RNs with the clinical area. Nurses can also earn Continuing Education Units and interact with other nurses as well as DMRC nurse volunteers.

Additionally, personal preparedness is essential for nurses, whether or not they respond in a disaster. Nurses should ask themselves these questions: Are you ready? Could you survive at home if you had to shelter in place? Do you have an emergency plan for your own household? Do you know your employer's emergency response plan? What is your role?

Personal preparedness is the first step to being crisis ready. Everyone should make a plan for communication and contacts, meeting spots and routes, health information, and evacuation and re-unification plans. Make a kit with food, drinking water, and necessary supplies for at least three days. Stay informed via the Delaware Emergency Notification System (DENS) and Emergency Alert System (EAS) radio stations.<sup>11</sup> Nursing is an essential role in any organization, which means that they have a duty to report to work despite what may be going on around them. Nurses are caregivers and reliable responders. Emergency care during an MCI or disaster is governed by the Crisis Standard of Care and policies designed to protect clinicians responding during a crisis. An employer may provide travel, housing, and food for a time and is ultimately responsible for the health and safety of responders.

We cannot stop a disaster from occurring, but we can be prepared. Nursing is a sizeable workforce in the U.S. and

an ideal partner in providing health care services during a disaster. Nurses are educated in medical care, thrive in chaotic environments, are experienced team players, and are well connected and trusted in the community. Nurses should develop their own home preparedness plans and then prepare for mandatory or voluntary reporting opportunities.

Training and practice are key to successful disaster mitigation.

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**Saturday, October 26, 2019**

# The 12th Annual Delaware Orthopaedic Symposium

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**John H. Ammon Medical Education Center  
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**New for 2019: Simulcast to Bayhealth Hospital, Sussex Campus.**

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- ▶ Nationally recognized guest speakers.
- ▶ Three educational tracks:
  - Orthopaedic Surgery.
  - Primary Care Orthopaedic Medicine.
  - Orthopaedic Physical Therapy
- ▶ Continuing education.
- ▶ Submit a research poster for display at the symposium.



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of Orthopaedic  
Surgeons**



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# MINI TIP

## CARING FOR YOURSELF AND OTHERS IN TIME OF CRISIS.

### YOU ARE THE HELP, UNTIL HELP ARRIVES.

No matter how rapid the arrival of professional emergency responders, bystanders will always be first on the scene. A person who is bleeding can die from blood loss within five minutes; therefore, it is important to quickly stop blood loss. Those nearest to someone with life-threatening injuries are best positioned to provide immediate care.

In 2005, the White House launched a national awareness campaign, “Stop the Bleed” to cultivate grassroots efforts that encourage bystanders to become trained, equipped, and empowered to help in a bleeding emergency before professional help is able to reach the patient. These actions can help save a life:

- See something – Do something.
  - Be aware of your surroundings - move yourself and the injured person to safety if necessary.
  - CALL 911.
- Control of bleeding is critical to survival.
  - In cases of severe bleeding, act fast to stop the active bleeding.
  - Apply firm steady pressure with both hands to the bleeding site.
  - Apply a dressing of bandages or clothing, and then put firm steady pressure over the bandages with both hands.
  - If the bleeding does not stop, apply a tourniquet 2 to 3 inches closer to the torso.

The Stop the Bleed program is funded by federal grants, which gives the Delaware Office of Emergency Medical Services (OEMS) the opportunity to train civilians on how to use tourniquets. If you would like to take a course to prepare yourself to assist injured people if you are ever involved in a traumatic event, contact the OEMS at 302-223-1350 or email OEMS@delaware.gov.

**You can be prepared. You can save a life.**



SAVE A LIFE



Sussex County Paramedic Margaret Callaway, left, instructs Cindy Phipps, center, and Barbara Reed at a “Stop the Bleed” training at Legislative Hall in May 2019. Photo by Donna Sharp

# Being pet prepared saves human and animal lives

Karen A. Clark

Division of Public Health, Office of Animal Welfare

## ABSTRACT

Dave had never seen it rain so hard, for so long. Through the safety of his home, he and his Jack Russell terrier, Charlie, watched as a flash flood engulfed his neighborhood. To his shock, the floodwaters began pouring into his home and within minutes, the water was up to his ankles. In a panic and cradling Charlie, Dave realized there was no time to grab the dog food or Charlie's medication. They just had to get out and to safety.

Household pets rely on their owners to keep them safe. Pet owners should include pets in their emergency plans to keep them out of harm's way when the unthinkable happens.

We do not always have advance warnings for disasters. While blizzards, hurricanes, and tidal flooding can be forecasted and tracked, tornadoes, earthquakes, fires, and flash floods can take place suddenly, without warning. When requested to evacuate, pet owners should always take their pets with them; otherwise, their beloved animals can become injured, get lost, or die. It is not recommended for pet owners to remain at home with their pets instead of evacuating to a safe location, like a pet-friendly co-located emergency shelter. That decision may endanger people, their pets, and the first responders who may need to rescue them.

As people were evacuated during Hurricane Katrina in 2005, they were urged to take their pets with them. However, not all emergency shelters would accommodate companion animals. Soon after, emergency agencies began to include pets in evacuation and emergency shelter plans. The State of Delaware created the Delaware Animal Response (DAR) program to help prepare the community for disasters and emergencies that affect companion animals and their owners. The State further expanded protections for companion animals in 2013, by creating the Office of Animal Welfare (OAW) within the Division of Public Health (DPH) to protect the health, safety, and welfare of companion animals and to promote the human-animal bond. The DAR program, based within OAW, is comprised of volunteers that make up the State Animal Response Team (SART) and the Veterinary Medical Reserve Corps (VMRC).

Companion and service animals play a large role in Delawareans' health, safety, and welfare. According to the Delaware Population Consortium, Delaware's estimated 2019 population is 982,188. When that data is applied to the American Veterinary Medical Association Pet Calculator, it reveals that the state has over 264,000 pet-owning households that may include dogs, cats, birds, and small animals. OAW recommends that all pet owners create a pet emergency plan. Before developing an emergency plan, identify all possible destinations depending upon the nature of the emergency, and determine how pet care will be provided.

## CONSIDER THE FOLLOWING:

- Should a disaster or emergency strike when the pet owner is not at home, developing a buddy system with neighbors or friends will ensure that someone will care for the pets.
  - If you are evacuating to the home of friends or family in another area of town, city or state, ask them if pets will be permitted to come with you during an evacuation.
  - Prepare a listing of pet-friendly accommodations, boarding facilities, veterinary offices, and clinics outside the immediate area. If you must evacuate to a shelter, confirm in advance if the shelter accommodates pets and what requirements they have, such as requiring owners to leash dogs or transport cats in carriers. Evacuation announcements should include the locations of emergency pet shelters and will vary based on the actual emergency.
  - Know which local television or radio stations will provide emergency information such as general conditions, road closures, and the locations of local emergency evacuation pet shelters.
- Being pet prepared also means having pet items ready now, in case it is necessary to evacuate with pets or shelter in place with them at home.
- Dogs and cats should wear a collar with identification tags, including a license tag for dogs. (State of Delaware licenses can be purchased at [www.petdata.com/for-pet-owners/dlw/license-online](http://www.petdata.com/for-pet-owners/dlw/license-online).) If pets are micro-chipped, make sure the chip is registered, and the current owner's updated contact information is on file with the microchip company. Be sure to list a cell phone as a primary contact number.
  - Have a pet carrier/crate, leash, and harness ready to go. Have pets practice going in and out of the carrier/crate, and reward them with treats, to make the process quick and easy.
  - Create a pet preparedness "go bag" that includes the essentials of three days' worth of food, water, treats, and pet medications. Include a pet first aid kit ([www.aspapro.org/resource/saving-lives-shelter-health-poison-control/how-make-pet-first-aid-kit](http://www.aspapro.org/resource/saving-lives-shelter-health-poison-control/how-make-pet-first-aid-kit)), bedding, sanitation supplies such as waste bags, litter and box, paper towels, cleaner, and a few favorite toys to help keep them occupied. Place an extra leash and harness inside as well.
  - Have copies of pet vaccination records and veterinarian contact information ready, should the pet become ill or injured, or if the decision is made to evacuate to one of Delaware's pet-friendly evacuation shelters. Keep copies of these pet documents in a sealable, water-resistant plastic bag. Make sure they include medical and vaccination records; license and microchip numbers; current close-up and full-body photos of each pet; and any special care instructions, in case the pet owner is injured.
  - Pet owners should keep a picture of them with their pets on their smartphones in case a pet becomes lost or ownership of a found pet needs confirmation.

Take action with pets when a disaster or emergency strikes. Follow these tips:

If sheltering at home, keep pets limited to one room. Separate dogs and cats, and do not let pets hide in the home. During the midst of a storm, it is best to remain inside with pets. If a pet must go outside during inclement weather, make sure that its collar and leash fit well, stay close to home, and watch for any downed trees or power lines.

- Keep pet collars and identification tags on them at all times. Keep small pets in their carrier or habitat that should be clearly marked with the pets'/pet owner's information.
- When evacuating with a pet, load a vehicle with the pet's "go bag" and secure the pet in its carrier, crate, or habitat.
- At pet-friendly emergency evacuation shelters, DAR volunteers will register pets and assist pet owners with their care. They will ask for pet vaccination records and special care information. Individuals and their pets will be co-located in the same evacuation facility.

For more information on the DAR program, SART or VMRC volunteer opportunities, visit <http://dhss.delaware.gov/dph/oaw/dar.html> or call 302-242-3594. In addition to staffing pet-friendly emergency evacuation shelters during disasters and emergencies, DAR volunteers provide pet preparedness information at community events. No experience is necessary; volunteers only require a love of animals and a willingness to help people and their pets in a time of need. DAR provides all training.

DAR's nextem ergency pet sheltering training is on November 2 and 3, 2019, at the DPH Training Center in the Edgehill Shopping Center in Dover. American Humane, a national responder for pets in disasters, will instruct this course. Delaware-licensed veterinarians and veterinary technicians will receive 11 hours of Continuing Education. There is no cost for DAR volunteers. For additional course information, contact [DAR@delaware.gov](mailto:DAR@delaware.gov).

## RESOURCES

Delaware Department of Health and Social Services, Division of Public Health, Office of Animal Welfare, [www.dhss.delaware.gov/dhss/dph/oaw/oawhome.html](http://www.dhss.delaware.gov/dhss/dph/oaw/oawhome.html)

Delaware Population Consortium, Office of State Planning Coordination, <http://stateplanning.delaware.gov/demography/documents/dpc/DPG2018v1.pdf>

American Veterinary Medical Association Pet Calculator, <https://www.avma.org/KB/Resources/Statistics/Pages/US-pet-ownership-calculator.aspx>

American Society for the Prevention of Cruelty to Animals – ASPCA Pro <http://www.aspapro.org/resource/saving-lives-shelter-health-poison-control/how-make-pet-first-aid-kit>

Delaware Department of Health and Social Services, Division of Public Health, Office of Animal Welfare, Paw Prints newsletter, Winter 2015, <https://www.dhss.delaware.gov/dhss/dph/oaw/files/oawpawprints122015win.pdf>



## DIY Pet First-Aid Kit

Use this kit in an emergency until your veterinarian can take over

### Here's What You'll Need:

- 1) Phone number, clinic name, address of your veterinarian **PLUS** contact info for local veterinary emergency clinics
- 2) Absorbent gauze pads
- 3) Adhesive tape
- 4) Cotton balls or swabs
- 5) Fresh 3% hydrogen peroxide to induce vomiting  
(always check with veterinarian or animal poison control expert before giving to your pet)
- 6) Ice pack
- 7) Disposable gloves
- 8) Scissors with blunt end **PLUS** tweezers
- 9) Over-the-counter antibiotic ointment
- 10) Liquid dishwashing detergent for bathing **PLUS** towels
- 11) Small flashlight
- 12) Oral syringe or kitchen baster
- 13) Alcohol wipes
- 14) Styptic powder
- 15) Saline eye solution **PLUS** artificial tear gel

For more information and a how-to video, go to [aspapro.org/resource/saving-lives/how-make-pet-first-aid-kit](http://aspapro.org/resource/saving-lives/how-make-pet-first-aid-kit)

ASPCApro.org  
ASPCApro.org/poison



The Office of Animal Welfare marks five years of helping animals and people

Winter 2019

November marked five years that the Office of Animal Welfare (OAW) has

protected the health, safety, and welfare of companion animals, and promoted the human-animal bond in Delaware.

The Delaware General Assembly established the OAW Taskforce recommended its creation to coordinate and manage programs, provide oversight, and address emerging issues with regard to companion animals. The public

has one centralized office for programs and services, which greatly reduces the confusion for residents and fragmentation of services that existed previously.

We operate with the following values:

- Animals should be protected from abuse and neglect. The public should be protected from dangerous animals.

- Homeless animals should receive safe shelter, care, and a chance for adoption.

- Programs that reduce pet homelessness and cruelty are important investments.

"In the five years since being established, OAW has made tremendous progress and growth," said Executive Director Christina Motyoshi. "From setting up an entire statewide law enforcement program to redesigning the Animal Welfare License plate, there is much to celebrate."

Since November 2013, OAW has:

- Consolidated State companion animal programs for improved efficiency and performance
- Delivered comprehensive

recommendations for improving animal control and cruelty enforcement functions in the state.

- Established Delaware Animal Services, the OAW's animal control and cruelty law enforcement unit

- Launched a statewide Lost & Found Pet Registry to reunite lost pets with their owners

- Drafted training and certification requirements for animal control officers and cruelty investigators

- Established enforcement provisions for the Shelter Standards law

- Launched a comprehensive shelter oversight program

- Overhauled dog licensing to increase accessibility and compliance

- Revitalized Delaware Animal Response (DAR) to assist animals in disasters

- Revamped the State Spay & Neuter Program with an online application, marketing campaign, and upgraded database to increase the utilization of low-cost spay/neuter surgeries

- Planned and hosted the first Delaware Animal Rescue Summit

- Hosted Delaware Spay Days to provide free surgeries to individuals with low incomes

- Launched the proposed Animal Welfare License plate to increase spay/neuter sterilizations

"We've made great strides in our mission to help animals and people, and look forward to the next five years of promoting animal welfare in Delaware," Motyoshi said.

Page 1



# Review of Emerging Infectious Disease Preparedness Measures for the State of Delaware

Nikki Kupferman, M.S., Vaccine Preventable Disease Epidemiologist, Delaware Division of Public Health  
Emily Hanlin, Epidemiologist, Office of Preparedness, Delaware Division of Public Health

## ABSTRACT

Emerging infectious diseases (EIDs) are a growing global concern as more of these pathogens or their associated illnesses are identified, and human migration continues to increase. The state of Delaware has an intricate system to monitor, prepare for, and take action against these diseases. To effectively prepare for an outbreak of an infectious disease, there is a high level of inter- and intra-organizational communication, evolutions from previous situations, and cooperation with the public. EID preparedness plans are constantly changing to adapt to the situations at hand, making collaboration with all stakeholders crucial for a sufficient outbreak response.

## BACKGROUND

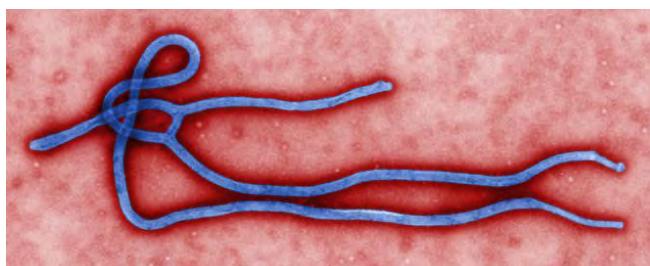
An emerging infectious disease (EID) is characterized as rapidly increasing incidences of an infectious disease over two decades, or those having the potential to proliferate exponentially in populations in the near future.<sup>1</sup> These diseases include new infections resulting from changes of existing pathogens, known infections spreading to new regions, newly recognized infections in areas undergoing ecologic transformation, and old infections re-emerging as a result of antimicrobial resistance or a lapse in public health measures. Each year, more diseases are added to the growing list of what are considered emerging or reemerging infectious diseases with the potential to cause epidemics or pandemics. In 2007, the World Health Organization reported that over 40 diseases had been newly identified since the 1970s, including Human Immunodeficiency Virus (HIV) and Severe Acute Respiratory Syndrome (SARS).<sup>2</sup> These diseases set an unprecedented rate of discovery at one more disease per year. This list of EIDs has also expanded to include diseases that have developed antibiotic resistance over time, such as Streptococcus pneumoniae and Mycobacterium tuberculosis. Many of these diseases are sensationalized through global media, especially in cases such as Ebola Hemorrhagic Fever, Middle East Respiratory Syndrome Coronavirus (MERS-CoV), and measles, while others, like health care-acquired infections spurred by antibiotic resistance, gain less attention. EIDs can be challenging to control as international travel continues to increase and populations interact. While humans have lived with emerging and re-emerging pathogens for centuries, in recent decades, EID incidences have increased exponentially. This is likely due to a number of factors, including changes in human demographics and behavior, international travel and commerce, climate and weather; a breakdown of public health measures; and poverty and social inequality, in addition to other complex global components.<sup>9</sup>

EIDs place a significant burden on global economies, public health resources, and health care facilities. Worldwide, infectious diseases are the cause of 25 percent of overall annual deaths.<sup>3</sup> Even with the availability of safe and cost-effective vaccinations, vaccine preventable diseases (VPDs) such as mumps and measles are becoming more prevalent in the United States after being curtailed for decades.<sup>8</sup> Complications from infectious diseases can

also lead to chronic disability or have psychological impacts. With the number of EID cases rising, the potential for an outbreak is also increasing. Fortunately, the health care community and the general public can prepare for potential outbreaks through strong collaborative efforts and prevention education.

Important prevention and preparedness measures begin with the individual. The general public should know how to access up-to-date and accurate information about EIDs. Knowing the signs and symptoms of a disease that is currently affecting or threatening to expand into one's region can lead to prompt recognition, treatment, and prevention of further transmission. Prevention tactics are good hand hygiene, social distancing, quarantine, and vaccination. Individuals should also keep a supply of food, medicine, and other basic needs stocked at their home in case they are quarantined due to an EID outbreak. These personal efforts can maintain a healthy community during the course of an escalating public health situation.

The Delaware Department of Health and Social Services, Division of Public Health (DPH) ensures EID preparedness through two data collection systems and/or provider reporting: the Delaware Electronic Surveillance System (DERSS) and the Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE). ESSENCE is licensed to Delaware and other states by Johns Hopkins University. DERSS receives case information and laboratory reporting for communicable diseases. Notifiable disease reporting requirements are guided by the Centers for Disease Control and Prevention (CDC) and Council for State and Territorial Epidemiologists, and health care providers must comply.<sup>4,10</sup> EID preparedness is further maintained through syndromic surveillance, which relies on the reporting of health indicators, or syndromes, such as fever, rash, exposure, or injury, prior to a confirmed diagnosis.<sup>5</sup> This epidemiological tool evolved in the early 2000s to respond to and mitigate potential



agents of bioterrorism.<sup>6</sup> Since then, syndromic surveillance expanded to an all-hazards approach, given the availability of data from electronic health records.<sup>7</sup> While much of the data is not as specific as NNDSS reporting, it is timely and sensitive.

The 2014 Ebola outbreak in Africa led to Delaware's adoption of the One Health concept, a strategy recognizing that the health and well-being of the human population, animals, and the environment are directly connected and call for expanding interdisciplinary collaborations and communications. The One Health approach gathers critical stakeholders and decision makers to forge programs and policies to prevent unintended consequences of decisions made in isolation. Enhancing communications leads to greater coordination of disease surveillance and prevention activities, which enhances public health efficacy, expands scientific knowledge, and improves medical education and clinical care. Collaborative efforts across the professions can have a profound impact on the speed of decision-making and improved overall communications and care for the patient.

The One Health approach in Delaware has also been used to address other public health concerns such as food safety, antibiotic resistance, and zoonotic diseases through its multi-sectorial, multi-disciplinary standpoint. Disease surveillance activities performed across multiple disciplines within human, animal, and environmental health lead to effective detection, response, and mitigation of disease, including EIDs with the threats of cross-species transmission and pandemics. Preventative measures are principal for EID, but it is implausible to assume complete eradication is attainable given current socioeconomic, environmental, and ecological factors. Furthermore, infectious diseases are constantly adapting and evolving in hosts. Vaccines and antimicrobials have revolutionized prevention and control, and led to overall human health protection, but the unpredictability of infectious diseases continuously challenges health care and public health providers. While the goal of public health prevention is key, effective countermeasures and preparedness are equally crucial and require effective leadership, structure, and resource prioritization.

## METHODS

If an EID outbreak detected through routine surveillance or provider reporting reaches either statewide or local emergency status, the DPH director will collaborate with the Emergency Medical Services and Preparedness Section (EMSPS) to activate the State Health Operations Center (SHOC) for medical response.<sup>11</sup> The intended purpose of SHOC is to yield an organized response with a central management structure. SHOC follows the Incident Command Structure (ICS) and is activated at levels based on the severity of the emergency. ICSs were revised to an all-hazards approach following lessons learned from Hurricane Katrina in 2005 and the 2009 novel influenza A/H1N1 pandemic.<sup>12</sup>

Inter- and intra-agency coordination is essential for managing responses to EID.<sup>13</sup> For general public health detection and response to EID, routine surveillance is ongoing through DPH's Office of Preparedness and the Office of Infectious Disease Epidemiology. In the event of an EID outbreak, such as the 2009 H1N1 pandemic, active surveillance immediately replaces passive surveillance, and SHOC is activated for severe instances. When SHOC is activated for an EID, DPH works with additional state and federal stakeholders, including the CDC, the Delaware Emergency Management Agency (DEMA), the Delaware Medical Reserve Corps (DMRC), and the Delaware Department of Safety and Homeland Security (DHS) in the same facility for continuous, streamlined operations. Capitalizing on its small geographic size, state-level stakeholders as well as laboratories, hospitals, and long-term care facilities form a collaborative approach to EID preparedness. The readiness of all stakeholders must be frequently tested during exercises.

Detailed preparedness plans within DPH take an all-hazards approach to emergencies; however, EID-specific plans are also in place.<sup>14</sup> The High Consequence Infectious Disease Surveillance and Response Plan (HCID) is used for any EID from an infectious organism or a biological toxin that usually causes an illness of low-incidence and high morbidity and/or mortality rates.<sup>15</sup> Use of this plan would be appropriate for incidences involving the Ebola virus or MERS-CoV. Generalized outbreak response plans are applied to EIDs of low consequence, and a VPD outbreak response plan is critical to address resurgence throughout the U.S. DPH's Mass Fatality Management Plan, Contagious Disease Containment Measures Plan, Pandemic Influenza Plan, and Medication and Medical Supplies Management Plan support overall response to an EID, and they are routinely exercised and revised. In Delaware, judicial orders authorize isolation and quarantine measures and public health officials decide the length of isolation and quarantine under Titles 16 and 20 of the Delaware Code.<sup>16</sup>

Gathering and disseminating credible information about EIDs and outbreak response actions is a central part of DPH's preparedness planning. During an active outbreak, DPH releases pertinent information to the public so they can take recommended actions for their own health and the health of their community. This information may include facts about the disease, avoidance of transmission, designated locations for treatment, prophylaxis, vaccination; and the disease's impact. Unfortunately, many websites and media channels rely on anecdotal evidence or provide unfounded information, leading to the spread of



misinformation that can generate unnecessary fear of certain health care practices, such as vaccination. When searching for credible sources pertaining to EIDs, it is essential to identify news sources and articles that cite peer-reviewed journals or official government public health organizations. Distinguishing these sources can stop the spread of misinformation and aid the public health response to an emergent outbreak situation.

## RESULTS

Two recent examples underline the importance of strong inter-agency collaboration, even in the absence of SHOC/ICS activation. In March 2018, mumps cases spread from a Mexican dance gathering (hereafter known as a Baile) in New Castle County, Delaware. A bilingual preparedness epidemiologist overcame an initial language barrier to obtain information from Baile participants and their close contacts. The EMSPS identified DMRC volunteers to meet language-specific needs, and an EMSPS planner position facilitated coordination between the two groups.<sup>17</sup>

In May 2019, the Delaware Public Health Laboratory (DPHL) received a presumptive positive test result for MERS-CoV, escalating an EID response involving SHOC. There was a strong suspicion for MERS-CoV, given the patient's symptoms, travel history to the Middle East, and close contact with camels. DPH notified CDC's Emergency Operations Center according to protocol, and DPHL initiated retesting. Within two hours of a presumptive positive result, DPH held a conference call between internal stakeholders, the hospital where the patient was seen, and the CDC. DPHL arranged for the specimen to be shipped to the CDC the following day for confirmatory testing, and the EMSPS was scaled to activate SHOC and implement the HCID plan, should the CDC confirm positivity. Subsequent testing the following day indicated that the initial result was deemed a "false positive."<sup>17</sup>

Public health education is a central part of being prepared for any EID situation. Education on intervention methods prepares the public for a communicable disease outbreak by teaching them safety measures that could be employed. Pharmaceutical interventions, such as vaccinations and antimicrobials, prevent transmission and limit the severity of illness; however, not all individuals have access to a health care provider or the finances to acquire medications.<sup>18</sup> Non-pharmaceutical interventions are practicing proper hand hygiene and notifying health care providers of suspected contagious diseases at facilities prior to their arrival so they can take extra precautions. Other non-pharmaceutical measures are self-isolation or quarantine from one's family, cohabitants, and the public. Self-isolation may require telecommuting for work or staying home from social outings until the infectious period has passed.

By swiftly correcting misinformation about EIDs, vaccination, and other intervention methods, DPH avoids difficult resolutions that strain public health resources.

## CONCLUSION

DPH maintains strong surveillance and planning for EID. Gaps between periods of routine surveillance and Emergency Operations activation can make escalation of capabilities difficult since large-scale outbreaks and high consequence infectious disease occur infrequently. Since EIDs will continue to present

public health challenges, it is critical for DPH and health care, business, education, and non-profit sectors to exercise continuous preparedness practices for these scenarios.<sup>19</sup> Incomplete plans, inadequate funding, and lack of trained personnel can thwart effective preparedness response. Proper and sustained funding is paramount. Effective EID surveillance requires ongoing public health funding for personnel and materials, which is at times limited. Federal funding streams have significantly decreased on a national level, since 2001, with a 60 percent per-capita decrease between 2003 and 2016 (American Journal of Public Health, 2017). For DPH to maintain its EID readiness, all stakeholders must prioritize improvements in preparedness capabilities and identify gaps in workforce staffing and development.

Being prepared for an EID outbreak calls for a flexible system that can adapt as a situation evolves or develops as new lessons are learned. DPH's EID and resurgent VPD plans need public support, which can result from education about disease prevention and how to stay safe during an outbreak. With substantial collaboration and dedication to public health, the state can effectively prepare for and manage EID outbreaks.

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## MINI TIP

### WEATHER ADVISORIES, WATCHES, AND WARNINGS

The National Weather Service regularly issues advisories, watches, and warnings for various types of hazards, including winter weather, extreme heat, severe thunderstorms, hurricanes, tropical storms, and storm surges.

#### *Advisory:*

Highlights special weather conditions that are less serious than a warning. They are for events that may cause significant inconvenience, and if caution is not exercised, it could lead to situations that may threaten life and/or property.

#### *Watch:*

A watch is used when the risk of a hazardous weather or hydrologic event has increased significantly, but its occurrence, location, and/or timing is still uncertain. It is intended to provide enough lead time so that those who need to set their plans in motion can do so.

#### *Warning:*

A warning is issued when a hazardous weather or hydrologic event is occurring, is imminent, or has a very high probability of occurring. A warning is used for conditions posing a threat to life or property.

Set cell phones to receive free government text messages known as Wireless Emergency Alerts. They warn of severe weather and other emergencies, including Presidential Messages during national emergencies. When asleep, keep cell phones nearby to hear emergency alerts. For more information, visit [www.weather.gov/wrn/wea](https://www.weather.gov/wrn/wea).

## RESOURCE

National Oceanic and Atmospheric Administration, National Weather Service, <https://w1.weather.gov/glossary/index.php>

# Chemical Disaster Preparedness for Hospitals and Emergency Departments

Gregory K. Wanner, D.O., *Emergency Physician, Academic Faculty, Associate Chair, Emergency Management Committee, Christiana Care Health System; Hazardous Materials Technician, Certified; Clinical Assistant Professor, Emergency Medicine, Thomas Jefferson University; Clinical Assistant Professor, Emergency Medicine, Philadelphia College of Osteopathic Medicine*

Sukhi Atti, M.D., *Emergency Physician, Medical Toxicology Fellow, Emory University School of Medicine*

Edward Jasper, M.D., *Emergency Medicine Physician, Co-Chair, Emergency Management Committee, Thomas Jefferson University Hospital; Associate Professor, Emergency Medicine, Thomas Jefferson University*

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## ABSTRACT

Preparing to evaluate and treat victims of a chemical exposure incident is one aspect of hospital disaster preparedness. Past chemical disasters, including terrorist attacks and industrial or transit accidents, have highlighted the need for hospital planning, preparation, and training. Emergency department and hospital staff members must be familiar with their facility-specific protocols and be trained for their individual roles during these incidents. This article provides a brief review of the requirements and guidelines related to chemical disaster response from a healthcare perspective. Resources for training and the evaluation of chemically contaminated patients are discussed. Decontamination procedures, including pre-hospital and hospital-based decontamination of ambulatory, non-ambulatory, and at-risk patients are also reviewed. Physicians and clinicians, especially in the emergency department, must be familiar with methods of evaluating chemical exposures, identifying substances, recognizing toxicodromes, ensuring appropriate personal protective equipment (PPE) use, performing decontamination, and initiating treatments for life-threatening conditions. By understanding the guidelines and resources available, clinicians will be better equipped to safely evaluate and treat chemically exposed or contaminated patients.

## INTRODUCTION

During a disaster involving chemical exposures, hospitals will be called upon to care for victims. Emergency department (ED) and hospital staff need sufficient training to provide safe and effective care.<sup>1</sup> Several past chemical incidents have highlighted the need for hospital preparedness. In 1995, a large-scale chemical disaster occurred in Tokyo, Japan, involving the intentional release of sarin gas (an organophosphate nerve agent) in several city subway stations. As a result of that terrorist attack, over 5,500 victims sought medical attention, including approximately 500 patients arriving within the first hour at one hospital. Overall, 12 people died, 111 had moderate to severe injuries, and 110 health care workers were secondarily exposed and developed mild symptoms.<sup>2,3</sup> This disaster highlighted the importance of preparing hospitals for chemical attacks and exposures. Aside from terrorism, more common causes of chemical disasters are industrial and transit incidents involving toxic industrial chemicals (TICs).<sup>1</sup> A 2005 train derailment in Graniteville, South Carolina, caused the rupture of a chlorine-containing tank car, releasing nearly 60 tons of chlorine gas. As the dense chlorine gas cloud spread out close to the ground, hundreds of people were affected: 597 patients were seen at emergency departments and clinics, 71 were hospitalized, and nine people died as a result of the chlorine exposure.<sup>4</sup> In 2012, a train derailment in Paulsboro, New Jersey caused the leakage of 20,000 gallons of vinyl chloride into a creek. Within a few hours, 77 patients were seen in the nearby emergency department and six patients were admitted.<sup>5</sup> These events, and many others, have illustrated the importance of hospital preparedness for chemical-related disasters.

## PLANNING AND RESPONSE RESOURCES

In recent years, the United States federal government has sponsored and released several guidelines and resources to assist in the response to a chemical disaster. In 2005, the Occupational Safety and Health Administration (OSHA) released a comprehensive guideline for hospital-based first-receivers of victims from incidents involving hazardous substances.<sup>1</sup> This document outlined OSHA's guidelines for personal protective equipment (PPE), training, monitoring, response, and recovery related to these incidents. In 2018, the Primary Response Incident Scene Management (PRISM) series was updated, providing evidence-based guidelines on mass decontamination during a chemical incident.<sup>6,7</sup> Additional clinical resources include the Chemical Hazards Emergency Medical Management (CHEMM) website and the Wireless Information System for Emergency Responders (WISER) website and smartphone applications. These electronic resources can be used in the clinical environment to help identify a chemical substance and guide the decontamination and initial treatments. Poison Control Centers (1-800-222-1222) also serve as valuable resources in providing guidance and elicit the expertise of a medical toxicologist to help identify chemical classes, recognize toxicodromes, and assist with triage needs.<sup>10</sup> Useful resources include:

- **WISER application ([www.wiser.nlm.nih.gov](http://www.wiser.nlm.nih.gov)):** Developed by the U.S. National Library of Medicine, WISER provides a wealth of information on hazardous materials, substance identification, decontamination, and health information designed for clinicians and first responders, free of charge. WISER also directly links to the CHEMM resources (CHEMM) and the Emergency Response Guidebook (ERG) used by first responders to identify and manage the initial phase of a chemical release.<sup>9</sup>

- **CHEMM website ([www.chemm.nlm.nih.gov](http://www.chemm.nlm.nih.gov)):** Sponsored by the U.S. Department of Health and Human services, CHEMM includes guidelines for clinicians regarding the initial response, triage, decontamination, assessment, and treatment of chemically exposed patients. The website also directly links to two clinical decision tools for substance identification and decontamination. The PRISM Algorithm Suggesting Proportionate Incident Response Engagement (ASPIRE) tool assists in determining decontamination needs of exposed patients. The CHEMM Intelligent Syndromes Tool (CHEMM-IST) can potentially assist in the identification of a toxicodrome or chemical substance group for severe cases of exposure to an unknown chemical.<sup>8</sup>

These guidelines and resources can assist hospitals in preparing for chemical disasters. Hospitals must also work with local and state emergency management and public health officials to coordinate preparedness and response efforts.<sup>1,5</sup> Pre-planning for a large scale response should involve emergency medical service and fire department first-responders as well.<sup>1</sup> Chemical risks present in the local community, such as industrial sites or transportation routes, should be assessed in the hospital's hazard vulnerability analysis (HVA).<sup>1</sup> The HVA can help to identify local risks before an incident occurs, but cannot assess for every possible emergency situation. Thus, it is important for hospitals to develop chemical-disaster response guidelines as a part of the hospital's emergency operations plan (EOP) and ensure adequate training of staff members.<sup>1</sup>

## TRAINING

Health care workers should be trained to effectively evaluate and treat chemically-exposed patients. Many hospitals maintain a decontamination team or utilize an agreement with a local hazardous materials (HAZMAT) response team to provide decontamination of chemically-contaminated patients.<sup>1,11</sup> OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER) regulation (29 CFR 1910.120) sets standards for the training of emergency personnel.<sup>12</sup> OSHA later released guidelines for hospital-based "first receivers" of contaminated patients.<sup>1</sup> The training level for first receivers depends upon the expected role of each individual and their likelihood of encountering contaminated patients.<sup>1</sup> Staff members who would be expected to work in the hospital decontamination zone are required to be initially trained to at least the "First Responder Operations" level, which includes a minimum training of eight hours and includes hazard recognition, substance identification, site safety, response roles, PPE use, and decontamination procedures, plus an annual refresher.<sup>1,12</sup> The annual refresher must be "of sufficient content and duration to maintain their competencies, or shall demonstrate competency in those areas at least yearly" but a specific duration for the refresher training has not been established.<sup>1,12</sup>

The hospital or employer may use existing course(s) or develop their own training to fulfill the eight-hour initial training requirement.<sup>1</sup> Alternatively, employees demonstrating competency in these specific training areas may waive the training requirement; however, the training or competency levels must be certified by the hospital or employer.<sup>1</sup> For employees who work

in the contaminant-free area but whom may be in the position to identify a contaminated patient (ED clinicians or triage staff), training to the OSHA level of "First Responder Awareness" is recommended.<sup>1,12</sup> For support personnel that would otherwise be unlikely to encounter a contaminated patient, a "just in time" briefing is required if their assistance is unexpectedly needed in the hospital decontamination zone.<sup>1</sup> There are many resources for the training of health care workers. These include:

- **Center for Domestic Preparedness (CDP):** Organized under the Federal Emergency Management Agency (FEMA) and based in Anniston, Alabama, the CDP offers several courses, including an online HAZMAT awareness course and in-person courses such as CBRNE (chemical, biological, radiological, nuclear, and explosive) training, Hospital Emergency Response Training (HERT), and a train-the-trainer course which qualifies graduates to teach an eight hour course at their home institution. Courses through the CDP are typically free of charge, especially for local and state responders.<sup>13</sup>
- **Texas A&M Engineering Extension Service (TEEX):** Offers a free online 4-hour "WMD/Terrorism Awareness for Emergency Responders" course designed to meet OSHA's "First Responder Awareness Level" standards for hazardous materials and weapons of mass destruction (WMD).<sup>14</sup>
- **Advanced HAZMAT Life Support (AHLS):** Affiliated with the American Academy of Clinical Toxicology, the fee-based AHLS course focuses on the clinical care of chemical exposures for physicians and clinicians caring for these patients.<sup>15</sup>
- **American College of Medical Toxicology:** Offers several resources including a "Chemical Agents of Opportunity for Terrorism" course and free "Chemical Agents of Opportunity" webinar.<sup>16</sup>
- **U.S. Army Medical Research Institute of Chemical Defense:** Conducts a six-day "Medical Management of Chemical and Biological Casualties Course" geared to evaluating, triaging, and treating contaminated casualties.<sup>17</sup>
- Various other government and private organizations provide free and fee-based HAZWOPER or hazardous materials courses for decontamination team members.

## EVALUATION

When initially evaluating a chemically-contaminated patient, it is vitally important that the health care worker remains safe and does not contaminate him/herself.<sup>1,11,18</sup> Although the type of chemical substance is often known at industrial facilities, or can be identified by labeling placards in transportation incidents, in many circumstances the substance released may be unknown.<sup>1,19</sup> In these cases, clinicians should maintain a safe distance, use appropriate PPE (discussed in the "decontamination" section below), and attempt to determine the route of exposure and symptoms the patient is experiencing.<sup>1,19,20</sup> The following steps are recommended to evaluate victims of chemical exposures (see Figure 1):

- Identify a Chemical Release:** Initially, responders and victims may be unaware of a chemical release or exposure. Several signs of a mass casualty chemical exposure include similar physical symptoms, in several individuals, in a corresponding time frame (for example, eye irritation, nausea, difficulty breathing, weakness, confusion, burning sensation, etc.). Other indicators include environmental signs such as mass casualties of humans, wildlife, or insects in a delineated area, or discolored vegetation, coatings on surfaces, unusual odors, puddles, powders, or low-lying gas plumes. Having a high index of suspicion improves the rapidity of response to mitigate the health effects of a chemical release.<sup>21</sup>

- Identify Substance (if possible):** Chemicals at industrial site and transportation incidents are typically marked to allow for the identification of involved material(s).<sup>19</sup> In these settings, a Material Safety Data Sheet (MSDS or, more recently, referred to as “SDS”) should also accompany the material and can help guide the patient’s initial care.<sup>11</sup> It is important to ask pre-hospital or industrial site responders for the material’s SDS. If an SDS is unavailable, obtaining the United Nations (UN) four-digit identification number or Chemical Abstract Service (CAS) number can identify a substance and assist in determining appropriate care of the exposed patient.<sup>9,22,23</sup> The WISER application and Emergency Response Guidebook (ERG) or NIOSH Pocket Guide can assist in the identification of a substance by UN or CAS number.<sup>9,23,24</sup> It is important to note that many products consist of several chemical substances in combination and each substance should be identified. Manufacturers may be hesitant to reveal the specific chemical identity of a proprietary or “trade secret” product; however, according to OSHA, the specific identity must be disclosed “to a treating physician or nurse when the information is needed for proper emergency or first-aid treatment.”<sup>25</sup>

- Unknown Substance:** If the type of substance is not known, the clinician can gather information and obtain greater situational awareness by using signs, symptoms, and observations from the field to help determine the type of chemical or chemical group. The route of exposure (inhalation, dermal, ingestion), type of exposure (vapor, liquid, powder), duration, and location (home, industrial facility, farm, retail store) should be determined from the patient and first responders. Physical signs and symptoms can provide important information to assist in the identification of a chemical group or toxic syndrome (toxicodrome).<sup>20-22,26</sup>

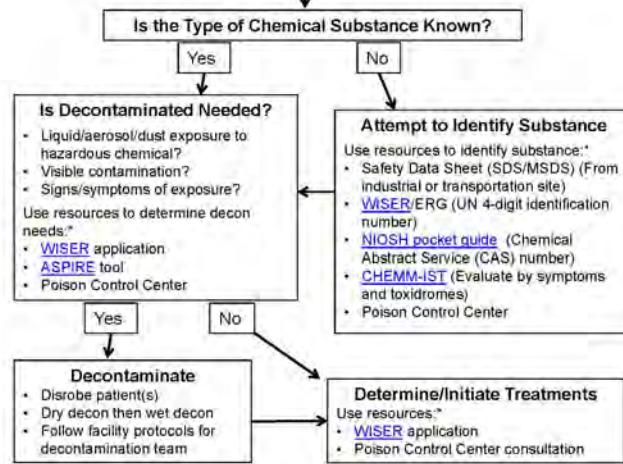
- Toxicodromes:** It is recommended that “toxicodrome recognition” be used to further assist in the identification of chemical classes to which patients may have been exposed. Toxicodrome recognition utilizes the constellation of clinical signs (vital signs, mental status, respiratory, skin findings) and symptoms that are characteristic of general classes of chemical substances.<sup>26,27</sup> Chemical groups with similar properties often produce similar clinical effects that help identify a toxicodrome.<sup>26,27</sup> Learning to recognize toxicodromes is an important skill, especially in a mass

casualty event, to execute an effective and timely response. Examples of toxicodromes associated with chemical exposures include “irritant/corrosive” (cough, wheezing, and skin/mucous membrane irritation or inflammation from corrosive acids/bases), “anticholinergic” (dilated pupils, confusion, dryness with reduced sweating, temperature elevation), “cholinergic” (salivation, lacrimation, urination, “leaking all over”), “anesthetic/sedative” (decreased level of consciousness, respiratory depression), “convulsant” (seizure-producing), “knockdown” agents (asphyxia, decreased level of consciousness, cardiorespiratory effects), and “blister agents/vesicants” (dermal burns, mucosal and dermal irritation, pain, upper and lower airway effects).<sup>11,26-30</sup> This list is not all-inclusive, but provides a general idea of the concept of chemical toxicodromes.

#### Chemically-Contaminated Patient Arrival or Notification

**Initial Evaluation and Lifesaving Treatments for Symptomatic Patients:**

- Avoid physical contact, consider staff safety, and review facility-specific guidelines.
- Wear Level C Personal Protective Equipment (PAPR/APR, Chemical-resistant suit, double gloves) if unknown substance type.
- Consider the airway and circulatory support needs of the patient(s).
- Lifesaving antidotes, based on toxicodrome (atropine/pralidoxime, hydroxocobalamin, etc.)



#### \*Resources

- Poison Control Center: 1-800-222-1222
- Wireless Information System for Emergency Responders (WISER): [www.wiser.nlm.nih.gov](http://www.wiser.nlm.nih.gov)
- Chemical Hazards Emergency Medical Management (CHEMM): [www.chemm.nlm.nih.gov](http://www.chemm.nlm.nih.gov)
- Chemical Hazards Emergency Medical Management Intelligent Syndromes Tool (CHEMM-IST): [www.chemm.nlm.nih.gov/chemist.htm](http://www.chemm.nlm.nih.gov/chemist.htm)
- Algorithm Suggesting Proportionate Incident Response Engagement (ASPIRE) tool: [www.chemm.nlm.nih.gov/aspire.htm](http://www.chemm.nlm.nih.gov/aspire.htm)
- National Institute for Occupational Safety and Health (NIOSH) Pocket Guide: [www.cdc.gov/niosh/png](http://www.cdc.gov/niosh/png)

Figure 1. Chemically-Contaminated Patient Arrival or Notification

## DECONTAMINATION

After considering the circumstances of the exposure and the involved substance or chemical group/toxicodrome, the need for decontamination (“decon”) must be determined. Although research-based recommendations of when to perform decontamination are limited, guidelines exist to help make this determination. The decision to decontaminate should take into account patients’ signs, symptoms, and evidence of visible exposure or contamination, proximity of the patient(s) to the chemical release, and the properties of the specific chemical (if known).<sup>6,7,11,18</sup> Additionally, decontamination should be considered if the patient requests it or if there is any reasonable risk of exposure to first responders or first receivers.<sup>19</sup>

Decontamination is typically started on the scene of a controlled incident; however, patients from uncontrolled or mass-exposure incidents may leave the scene and self-transport to the hospital ED. Hospitals must be prepared to receive and decontaminate these potentially contaminated patients.<sup>1,6,30</sup> Figure 2 shows the typical structure of a hospital decontamination corridor.



*Figure 2. Hospital Decontamination Zone. In a mass-casualty chemical incident, a decontamination corridor is often used to rapidly clean and move patients through the hospital decontamination zone. Photo by Gregory Wanner, at Hospital Emergency Response Training in Anniston, AL.*

Regarding personal protective equipment (PPE), hazardous materials responders at the scene (“hot zone”) of an unknown type of chemical release are often outfitted in Level A (fully encapsulating suit with self-contained breathing apparatus [SCBA]) or Level B (chemical resistant suit with SCBA) equipment.<sup>11,31-33</sup> This high level of respiratory protection, however, is not necessary for hospital-based first-receivers working in the potentially contaminated “hospital decontamination zone” away from the site of a release.<sup>1,11</sup> A time lapse of at least 10 minutes between a patient’s exposure and hospital arrival allows for “substantial levels of gases and vapors from volatile substances to dissipate.”<sup>1,18</sup> For this reason, Level C PPE, consisting of an air-purifying respirator (APR) or powered air-purifying respirator (PAPR) with appropriate filter cartridge, and a chemical-resistant suit with two layers of chemical resistant gloves, are recommended for first-receivers in a hospital decontamination zone (*see Figure 3*). Level D PPE (work uniform and everyday PPE) may be used for non-hazardous “nuisance” contamination or in handling clean patients after decontamination in the uncontaminated “post-decontamination zone.”<sup>1,11,31-33</sup>

Current decontamination procedure recommendations involve the following steps (*see Figure 1*):

- **Disrobe:** Patients should be instructed to remove all potentially contaminated clothing. This should occur either by carefully cutting or unbuttoning and gently pulling clothing downward, avoiding contact with the face and hair.<sup>6</sup> If clothing cannot be moved down and removed from the feet and no cutting instrument is available, patients should carefully guide the garment over their head, avoiding contact with the face, while holding their breath and eyes closed. Traditionally, it has been claimed that clothing removal from a fully clothed person reduces contamination by 80

to 90 percent; however, the source of this claim is unclear. More recent estimates suggest that clothing removal reduces contamination by at least 50 to 70 percent, depending on the location of contaminant on the body and type/amount of clothing worn.<sup>6</sup> In addition to removing liquid or powder/dust, removing clothing can also decrease exposure to vapors trapped within clothing or off-gassing of volatile liquids (such as gasoline).<sup>6,34</sup>



*Figure 3: Level C PPE for Hospital Decontamination Team. Level C PPE includes a powered air-purifying respirator (PAPR), chemical-resistant suit, and double gloves secured with chemical-resistant tape. Pictured is Dr. Nicholas Colazzo, emergency medicine resident physician, Christiana Care Health System. Photo by Gregory Wanner.*

- **Dry Decontamination:** Once clothing is removed, dry decontamination can be performed as an initial emergency decontamination method with any available absorbent material. Patients can self-perform this by blotting then carefully rubbing to avoid abrading the skin. This should start with the face and hair and work downward. Dry decontamination can be started immediately and can effectively begin to remove contaminant.<sup>6,35</sup> It can also be performed while setting up equipment for wet decontamination, if indicated.<sup>6</sup>

- **Wet Decontamination:** Involves using water and soap to remove caustic or harmful chemicals. Wet decontamination will likely be needed for exposures to a harmful liquid, aerosol, powder, or dust, but is less often needed for exposure to vapor or gas.<sup>11,18</sup> The decision to perform wet decontamination depends upon the signs/symptoms and properties of the chemical involved.<sup>11,19</sup> The potential for adverse effects, such as hypothermia, should also be considered.<sup>6,19,33</sup> Water-reactive chemicals can produce harmful effects (such as toxic or flammable gas) or a violent reaction when mixed with water.<sup>11,19</sup> Although rare, the

involvement of water-reactive chemicals should be considered and identified using the WISER application or ERG.<sup>9,24</sup> If the chemical substance can be identified, the ASPIRE tool can be used to help determine the need for wet decontamination.<sup>36</sup> Poison control centers can also provide valuable guidance regarding decontamination needs.

Wet decontamination typically involves two steps. The first step, “gross decontamination” is often performed at the exposure scene, unless the patient transports him/herself to the hospital prior to decontamination.<sup>6</sup> Gross decontamination may involve use of a safety shower at an industrial site or laboratory, or the fire department may set up a high flow, low pressure water mist often called a “ladder pipe system.”<sup>6,19</sup> In mass-casualty chemical incidents, gross decontamination is sometimes termed “mass decontamination.”<sup>6</sup>

Following gross decontamination, a more thorough washing should occur.<sup>6,11,18</sup> This second step is often referred to as “secondary,” “clinical,” or “technical” decontamination (note that some references call this step “technical” decontamination, while others use the term “technical” decontamination when referring to decontamination of staff and equipment; we will use the term “secondary” decontamination when referring to this step).<sup>1,6,19</sup> Secondary decontamination is supervised or assisted by trained decontamination team members. Washing is performed from head to toe using a washcloth, warm water, and mild soap (such as hand dishwashing detergent and/or baby shampoo).<sup>6,11,19,35</sup> Recommendations for washing time range from two to five minutes; however, more recent research suggests that at least 15 seconds of gross decontamination followed by a washing/rinsing period of 90 seconds may be adequate.<sup>1,6,18,35</sup>

The washing period should be followed by active drying with a towel or absorbent material.<sup>6</sup>

- **Triple Protocol:** A recent study tested the three-stage combination of:

1. Disrobing and dry decontamination
2. Ladder pipe system irrigation for 15 seconds
3. Secondary/technical decontamination washing for 90 seconds with a washcloth and baby shampoo, after intentional contamination with methyl salicylate mixed with baby oil.

The study found this “triple protocol” removed 100 percent (SD+/-1%) of chemical contamination. In contrast, dry decontamination alone removed 70 percent (SD+/-38%) of contaminant (highly dependent upon the cooperation of victims), and secondary/technical decontamination alone removed 95 percent (SD+/-9%) of contaminant.<sup>35</sup>

- **Non-Ambulatory and At-Risk or Special Needs Casualties:** Planning for decontamination procedures must also consider non-ambulatory patients, children, and patients with difficulty communicating or cognitive/physical disabilities.<sup>6,19,33</sup> These patients may require additional time and assistance with decontamination procedures.<sup>6,19,35</sup> Children should be kept with their families, if possible, who can assist with decontamination.<sup>6,11,19</sup> Patients who are non-ambulatory may

need to be carried on a stretcher by decontamination zone staff. Patients with language barriers or hearing difficulty may be assisted by pictorial instructions, body language gestures, or interpreters, if available.<sup>6,19</sup>

## TREATMENT

An initial assessment of airway, breathing, and circulation is paramount in managing patients with chemical exposures.<sup>11,26</sup> In a mass casualty incident, this initial “primary survey” assessment typically occurs rapidly along with the performance of triage. It is during the primary survey and triage of the patient that life-saving interventions should be considered, such as opening the airway, hemorrhage control, or chest needle-decompression of a tension pneumothorax.<sup>11,37</sup> One triage method, the “Sort, Assess, Lifesaving interventions, Treatment/Transport” (SALT) Mass Casualty Triage Algorithm, specifically includes these life-saving interventions along with the use of an antidote by auto-injector if a cholinergic toxidrome is observed.<sup>37</sup> The importance of quality supportive care should not be understated. Removal of the patient from the area of exposure and decontamination (if indicated) are vitally important steps.<sup>26,27</sup>

After the initial assessment with appropriate life-saving stabilizing interventions, a more comprehensive “secondary survey” should be performed to determine whether signs of a toxidrome are present and to administer antidotes, if indicated.<sup>20,26,27</sup> The use of resources mentioned in the “Planning and Response Resources” section of this article and discussion with the Poison Control Center are recommended. While the full spectrum of treatments available in a chemical disaster is beyond the scope of this article, a brief review of time-sensitive treatments for a few toxidromes include the following:

- **Cholinergic:** For organophosphates or nerve agent exposures, the patient must be removed from the environment, decontaminated, and started on supportive treatment and antidotes. For the “leaking all over” effects of cholinergic agents, atropine is given in high doses. Pralidoxime is also used to prevent the irreversible inhibition of acetylcholinesterase (called “aging”) in cases related to organophosphates. A commercially available auto-injector combines 2 mg of atropine with 600 mg of pralidoxime. The initial administration of up to three auto-injectors is recommended for adults, depending on severity of symptoms. Diazepam (10 mg) auto-injectors may also be needed to control seizures.<sup>20,26,27</sup> Instructions for auto-injector use are available from the National Institutes of Health (NIH).<sup>38</sup>
- **Irritant/Corrosive:** Treatments related to the chemical irritant or acid/base are dependent upon the symptoms and the water-solubility of the chemical. Evacuation from the exposure, decontamination, oxygen, and nebulized bronchodilators may be needed. Water soluble chemicals (such as ammonia or chlorine) typically cause immediate symptoms, while relatively insoluble irritant chemicals (such as phosgene) can cause delayed symptoms, such as pulmonary edema.<sup>20,26</sup>
- **Asphyxiant or “knockdown” agents:** These agents include various chemicals which can displace oxygen (such as

carbon dioxide, helium, propane, methane or nitrogen) or cause systemic effects (such as cyanide, carbon monoxide, or hydrogen sulfide). Removing the patient from the environment and providing 100% oxygen are most important. Agent-specific treatments should be considered, based on the situation. For example, a patient being transported from a house fire with respiratory distress, coma, or cardiac arrest could have carbon monoxide and/or cyanide toxicity. If cyanide poisoning is suspected, treatment with hydroxocobalamin should be started immediately in life-threatening cases, before laboratory results are available.<sup>20,26,27</sup>

Response and treatment are part of the overall community effort. It is important for hospitals to coordinate with their local EMS, law enforcement, fire departments, and emergency management agencies. Coordination between each of these groups is necessary to ensure stockpiled supplies and antidotes can be quickly distributed to an initial wave of patients.<sup>19,26</sup> Communities must also understand when to ask for state or federally available resources. Federally available resources include the Strategic National Stockpile for various medications and the CHEMPACK program for nerve agent antidotes. These resources can be quickly mobilized during a chemical disaster to augment local supplies.<sup>26,39,40</sup>

## CONCLUSION

Chemical disasters do occur and hospitals must be ready. An effective hospital response starts with preparation. Previously mentioned resources, in addition to guidelines and checklists such as those available through OSHA, PRISM, and Massachusetts General Hospital's Decontamination Resources, can help prepare hospitals and emergency departments.<sup>1,6,41</sup> Fortunately, chemical attacks are rare; however, many toxic industrial chemicals are commonly used, stored, and transported throughout the community each day. Understanding the concepts of chemical substance identification, toxicodrome recognition, PPE, and decontamination procedures is important in managing chemically exposed or contaminated patients. Physicians and clinicians must have the training and be familiar with the resources available to safely evaluate and treat victims of a chemical exposure incident.

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December 9  
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## FEATURING:

### Hospital Acquired Infections

Gonzalo Bearman, MD  
*Division of Infectious  
Diseases, VA*

### VACCINE HESITANCY

Gary Marshall, MD  
*Pediatric Infectious  
Diseases, KY*

### UPDATE ON DE HEALTH

Karyl Rattay, MD  
*Director, Dept. Public  
Health*

### ONE HEALTH

Karen Lopez, DVM

### RE-EMERGING THREATS

Karen Ravin, MD

### THREATS DUE TO THE OPIOID EPIDEMIC

Deborah Kahal, MD, MPH



## Just the FAQs: Essential information for Delaware health professionals

### What are PFAS? <sup>1</sup>

There are thousands of types of PFAS chemicals, some of which have been more widely used and studied than others. PFAS are man-made chemicals that have been used in industry and consumer products worldwide since the 1950s. They have been used in non-stick cookware, water-repellent clothing, stain resistant fabrics and carpets, some cosmetics, some firefighting foams, and products that resist grease, water, and oil. The most commonly studied PFAS are perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS).

### What is the Center for Disease Control and Prevention (CDC)/Agency for Toxic Substances and Disease Registry (ATSDR)'s PFAS Exposure Assessment in New Castle, Delaware?<sup>2</sup>

The 2018 National Defense Authorization Act authorized CDC/ATSDR to look at PFAS exposure in communities near current or former military bases and that are known to have had PFAS in their drinking water. The New Castle Air National Guard Base used aqueous film forming foam containing PFAS for firefighting training in the past. Residents who may have been affected include those who live in and near the City of New Castle. CDC/ATSDR began an exposure assessment in New Castle that included the collection of blood and urine samples in October 2019 from up to 400 randomly selected community members.

### Are PFAS harmful?<sup>3</sup>

While we don't know how human PFAS blood levels correlate to health effects, some studies in humans with PFAS exposure have shown that certain PFAS may:

- affect growth, learning, and behavior of infants and older children
- lower a woman's chance of getting pregnant
- interfere with the body's natural hormones
- increase cholesterol levels
- affect the immune system
- increase the risk of cancer

### What are PFAS levels in the U.S. population?<sup>4</sup>

Most people in the United States and in other industrialized countries have measurable amounts of PFAS in their blood. National values for PFAS in urine are being developed. Preliminary information from a North Carolina population found most participants did not have detections of PFAS in their urine.<sup>5</sup>

### What should health professionals tell their patients about PFAS blood and urine testing results?<sup>6</sup>

Currently, there are no established clinical reference levels for PFAS. Test results cannot predict past or future health problems and have limited clinical utility in medical management. At this time, there is no consensus related to long term medical management for those exposed to levels higher than background, so reducing exposure is the critical intervention.

The best strategy for health professionals is to offer guidance to families about how to identify and reduce current sources of PFAS exposure, including drinking water and consumer products. When health concerns arise that might be associated with PFAS, it is important to do a complete history, including exposure assessment and

<sup>1</sup> <https://www.atsdr.cdc.gov/pfas/overview.html>

<sup>2</sup> <https://www.atsdr.cdc.gov/pfas/PFAS-Exposure-Assessments.html>; <https://www.atsdr.cdc.gov/pfas/communities/New-Castle-County-DE.html>

<sup>3</sup> <https://www.atsdr.cdc.gov/pfas/health-effects.html>

<sup>4</sup> <https://www.cdc.gov/exposurereport/index.html>; [https://www.atsdr.cdc.gov/pfas/docs/pfas\\_clinician\\_fact\\_sheet\\_508.pdf](https://www.atsdr.cdc.gov/pfas/docs/pfas_clinician_fact_sheet_508.pdf)

<sup>5</sup> <https://www.cdc.gov/mmwr/volumes/68/wr/mm6829a4.htm>

<sup>6</sup> <https://www.atsdr.cdc.gov/pfas/pfas-blood-testing.html>;

[https://www.atsdr.cdc.gov/pfas/docs/pfas\\_clinician\\_fact\\_sheet\\_508.pdf](https://www.atsdr.cdc.gov/pfas/docs/pfas_clinician_fact_sheet_508.pdf); please see clinician factsheet for more details

physical exam relative to any symptom reported and manage the issue with established evidence-based guidelines (e.g., routine cholesterol screening; thyroid function tests if patient has symptoms consistent with thyroid dysfunction). Health providers should determine the need for monitoring based on risk factors such as age, sex, and exposures via drinking water, consumer products, and occupation.

### *Key Messages for Providers*

1. Reducing exposures to PFAS is the most important step for families with concerns about PFAS. A home water filtration system can reduce the contaminant levels in drinking water.
2. The most recent research data suggest that immunotoxicity and developmental toxicity are among the most sensitive health endpoints for PFAS.
3. Most people in the United States have some PFAS in their body. Those living in or near military bases, including both current and inactive bases, and near PFAS manufacturing facilities and other identified sources may have an increased risk of exposure.
4. If your patient presents with health concerns that might be associated with PFAS exposure, it is appropriate to discuss these concerns and perform a thorough exposure history and a physical exam relative to any symptoms reported. Health effects associated with PFAS are not specific and can be caused by many other factors. There are currently no guidelines to support clinical testing after exposure to PFAS. However, if your patient is concerned about PFAS exposures, discussing routine medical monitoring (e.g., blood lipids/cholesterol) can reassure the patient that his or her PFAS exposure concerns are being addressed.

### **Resources for Providers:**

The above are highlights for health professionals. More details (including Patient Q&A) are available in ATSDR/CDC's full clinician factsheet, which can be found at <https://www.atsdr.cdc.gov/pfas/info-for-health-professionals.html>. Other resources include:

- PFAS Overview: <https://www.atsdr.cdc.gov/pfas/index.html>
- PFAS information for health providers:  
<https://georgetown.app.box.com/s/wqy3ba1jo80urlh06k7507ejulzyian6>
- Medical Testing: <https://georgetown.app.box.com/s/da8t2cekmeidsgkqcq41i2sufd2tgmu1n>
- Water filtration systems: The types of filtration systems that can reduce PFAS levels in water, if properly maintained include granulated activated carbon (GAC) and reverse osmosis (RO). Information about these filters can be found at <http://kidsandenvironment.georgetown.edu>
- Map of PFAS contamination in the U.S.: [https://www.ewg.org/interactive-maps/2019\\_pfes\\_contamination/map/?\\_ga=2.23808661.486844503.1570472856-1840620370.1566495186](https://www.ewg.org/interactive-maps/2019_pfes_contamination/map/?_ga=2.23808661.486844503.1570472856-1840620370.1566495186)

### **For More Information:**

For more information, please contact MACCHE by phone at 1-866-622-2431 or email at [kidsandenvironment@georgetown.edu](mailto:kidsandenvironment@georgetown.edu). For information from ATSDR and the work being done in New Castle, DE, contact Karl Markiewicz PhD., Senior Toxicologist/Regional Liaison, 215-814-3149, [kvm4@cdc.gov](mailto:kvm4@cdc.gov)

The Mid-Atlantic Center for Children's Health and the Environment (MACCHE) is one of ten Pediatric Environmental Health Specialty Units (PEHSU) in the US, serving residents in Pennsylvania, Delaware, Maryland, Virginia, West Virginia, and the District of Columbia. MACCHE is the Region 3 PEHSU and is supported by the School of Nursing & Health Studies at Georgetown University Medical Center.

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# Delaware Journal of Public Health

Submission Guidelines  
*updated October 16, 2018*

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## ***About the Journal***

Established in 2015, **The Delaware Journal of Public Health** is a bi-monthly, peer-reviewed electronic publication, created by the Delaware Academy of Medicine/Delaware Public Health Association. The publication acts as a repository of news for the medical, dental, and public health communities, and is comprised of upcoming event announcements, past conference synopses, local resources, peer-reviewed content ranging from manuscripts and research papers to opinion editorials and personal interest pieces, relating to the public health sector. Each issue is largely devoted to an overarching theme or current issue in public health.

The content in the Journal is informed by the interest of our readers and contributors. If you have an event coming up, would like to contribute an Op-Ed, would like to share a job posting, or have a topic in public health you would like to see covered in an upcoming issue, please let us know.

If you are interested in submitting an article to the Delaware Journal of Public Health, or have any additional inquiries regarding the publication, please contact *DJPH* Deputy Editor Elizabeth Healy at [ehealy@delamed.org](mailto:ehealy@delamed.org), or the Executive Director of **The Delaware Academy of Medicine and Delaware Public Health Association**, Timothy Gibbs, at [tgibbs@delamed.org](mailto:tgibbs@delamed.org).

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## **Information for Authors**

### *Submission Requirements*

*The DJPH* accepts a wide variety of submission formats including brief essays, opinion editorials pieces, research articles and findings, analytic essays, news pieces, historical pieces, images, advertisements pertaining to relevant, upcoming public health events, and presentation reviews. If there is an additional type of submission not previously mentioned that you would like to submit, please contact a staff member.

Submissions should be completed under general APA guidelines for formatting and citations. Articles should be written in Microsoft Word format, in a clear, easily readable font with 1.5-inch to 2-inch spacing, and 1-inch margins. The suggested font is 12 point Times New Roman. Once completed, articles should be submitted via email to [ehealy@delamed.org](mailto:ehealy@delamed.org) as an attachment. Graphics, images, info-graphics, tables, and charts, are welcome and encouraged to be included in articles. Please ensure that all pieces are in their final format, and all edits and track changes have been implemented prior to submission.

### *Submission Length*

While there is no prescribed word length, full articles will generally be in the 2500-4000-word range, and editorials or brief reports will be in the 1500-2500-word range. If you have any questions regarding the length of a submission, or APA guidelines, please contact a staff member.

### *Copyright*

Opinions expressed by contributors and authors do not necessarily reflect the opinions of the *DJPH* or affiliated institutions of authors. Copying for uses other than personal reference or interest without the consent of the *DJPH* is prohibited. All material submitted alongside written work, including graphics, charts, tables, diagrams, etc., must be referenced properly in accordance with APA formatting.

### *Conflicts of Interest*

Any conflicts of interest, including political, financial, personal, or academic conflicts, must be declared prior to the submission of the article, or in conjunction with a submission. Conflicts of interest are any competing interests that may leave readers feeling misled or

deceived, and/or alter their perception of subject matter. Declared conflicts of interest may be published alongside articles in the final electronic publication.

#### *Nondiscriminatory Language*

Use of nondiscriminatory language is required in all DJPH submissions. The DJPH reserves the right to reject any submission found to be using sexist, racist, or heterosexist language, as well as unethical or defamatory statements.

#### *Additional Documents and Information for Authors*

**Please Note:** All authors and contributors are asked to submit a brief personal biography (*3 sentences maximum*) and a headshot along submissions. These will be published alongside final submissions in the final electronic publication. For pieces with multiple authors, these additional documents are requested for all contributors.

#### *Abstracts*

Authors must submit a structured or unstructured abstract along with their article.

The word limit is **200 words**, including headings. A title page should be submitted with this abstract as well.

#### **Structured abstracts should employ 4-5 headings:**

Objectives (begins with “To...”)

Methods

Results

Conclusions

A fifth heading, Policy Implications, may be used if relevant to the article.

Trial Registration information is required for clinical trials and must be included in the final version abstract

All abstracts should provide the dates(s) and location(s) of the study if applicable.

Note: There is no Background heading.

#### *Example of Information in Abstract*

**Objective:** State the objective or study question starting with “To ...” (e.g., “To determine whether...”).

**Methods:** Provide the basic design, place, year(s), setting, and number of participants of the study. If applicable, include the name of the study, the duration of follow-up. Indicate exposure and outcomes.

**Results:** Include quantitative results.

**Conclusions:** Provide only conclusions of the study that are directly supported by the results, whether positive or negative.

**Policy implications:** Provide a statement of relevance indicating implications for health policy, avoiding speculation and overgeneralization.

**Trial Registration:** For clinical trials, the name of the trial registry, registration number, and URL of the registry must be included in the cover letter ONLY and in the manuscript only after it is officially accepted.

Relevant Abbreviations should be mentioned here and will not be counted in the word limit.

# HELPFUL PREPAREDNESS RESOURCES

**Delaware Emergency Management Agency (DEMA):** [http://dema.delaware.gov/302-659-DEMA \(3362\)](http://dema.delaware.gov/302-659-DEMA (3362))

**Toll-free: 877-SAY-DEMA**

**Delaware only: 877-729-3362**

Latest news from DEMA: <http://www.dema.delaware.gov/news.shtml>

Know what to expect for each disaster type:

- Floods
- Heat Waves
- Hurricanes
- Thunderstorms and Lightning

## Local Emergency Management Agencies

- New Castle County Office of Emergency Management: 302-395-2700
- City of Wilmington Emergency Management Office: 302-576-3914
- Kent County Department of Public Safety Emergency Management Division: 302-735-3465
- Sussex County Emergency Operations Center: 302-855-7801

**Delaware Emergency Notification System (DENS)** is the primary system for public warning and emergency protective action information in the State of Delaware. Municipalities, counties, and state agencies utilize the system to inform the public during emergencies that adversely affect the health, safety, and welfare of Delaware citizens. Register online at: <http://dema.delaware.gov/services/DENS.shtml>

**Delaware Health Alert Network (DHAN)** is the online registration system for health care professionals. The DHAN is a secure, web-based public health communication system available 24/7/365 for distribution of health alerts. Register on this site to receive important health information for medical professionals:  
<https://healthalertde.org/>

**Delaware 2-1-1:** For help finding services in Delaware, call 2-1-1 or visit <http://www.delaware211.org/>

**SMART-911 online registry:** <https://www.smart911.com>

**Delaware Department of Transportation (DelDOT) evacuation routes by county:**  
[https://deldot.gov/information/projects/tmt/evac\\_map.shtml](https://deldot.gov/information/projects/tmt/evac_map.shtml)

**Preparedness Buddy Brochure** contains a step-by-step template for creating a personal emergency plan, especially for seniors and those with mobility and cognitive needs. It is available in English, Spanish, and Haitian Creole at <http://www.dhss.delaware.gov/dhss/dph/php/preparednessbuddy.html>.

**PrepareDE:** <https://www.preparede.org/>

## Emergency Alert System (EAS) Radio Stations in Delaware

### New Castle County

WDEL – AM 1150 / FM 101.7  
WSTW – FM 93.7  
WJBR – AM 1290  
WJBR – FM 99.5

### Kent County

WDOV – AM 1410  
WRDX – FM 94.7  
WAFL – FM 97.7

### Sussex County

WZBH – FM 93.5  
WOSC – FM 95.9

## National Oceanic and Atmospheric Administration (NOAA) All-Hazards Radio

A NOAA Weather Radio (NWR) provides an excellent source of up-to-date, real time emergency information. NWR requires a special radio receiver or scanner capable of picking up the signal. NOAA radios can be purchased online at Amazon or in local retail stores.

For more information, visit <https://www.nws.noaa.gov/nwr/>.

# Continuity Planning for the Health Care Delivery System: Building Resilience within Delaware

Reed Jones M.P.S., C.E.M.

Senior Planner and Emergency Manager, Office of Preparedness, Division of Public Health; Certified Emergency Manager (CEM), International Association of Emergency Managers (IAEM); Master Continuity Practitioner, The Federal Emergency Management Agency (FEMA)

## ABSTRACT

Delaware has a diverse and robust privately-owned health care delivery system incorporating hospitals, skilled nursing facilities, home health services, physician offices, diagnostic centers, specialty care treatment centers, mental and behavioral health and a variety of other components. The goal of this article is to inform the reader on why every health care organization should develop a continuity plan. We will dive deeper into the differences between emergency preparedness and continuity planning, while addressing several misconceptions. Furthermore, the reader will be able to understand the different continuity planning styles (COOP, BC and DR) and determine which process is best suited for the organization they represent. The reader will also gain an understanding of where the Centers for Medicare and Medicaid Services (CMS) emergency preparedness rules intersect with continuity planning. Lastly, a guide to foundational steps that should be taken to achieve success in developing or refreshing a continuity program is also presented.

Unless those who deliver health care in Delaware invest in continuity planning, they risk never being able to recover from events like natural disasters, human-caused events, and malicious technological breaches. Continuity planning places the organization in the best position to avert these and other threats.

Delaware has a diverse and robust for-profit health care delivery system that includes hospitals, skilled nursing facilities, home health services, physician offices, diagnostic centers, specialty care treatment centers, mental and behavioral health, and a variety of other components. In 2019, the U.S. Department of Labor, in collaboration with Infogroup, a leading provider of data and data-driven marketing solutions, found that health care providers represented three of the top five largest employers in Delaware, accounting for an approximate combined total of 20,000 employees.<sup>1</sup> To avert disaster, public and non-profit entities including Federally Qualified Health Centers (FQHC), divisions within the Delaware Department of Health and Social Services (DHSS), and others require the same level of continuity planning as their for-profit partners.

When examining the health care delivery system and the role of continuity, two distinct goals surface. First, individual businesses or agencies should have plans in place to recover business or mission functions after a disaster occurs. According to the Federal Emergency Management Agency (FEMA), “40 percent of small businesses never reopen after a disaster and another 25 percent, that do reopen, fail within a year.”<sup>2</sup> FEMA has found that “following a disaster, 90% of smaller companies fail within a year unless they can resume operations within 5 days.”<sup>3</sup> Continuity is not only important to a business’ bottom line, but it has a broader socioeconomic impact regarding employment and services. Second, the health care system must be maintained following a disaster. Rapid recovery of operations after an event is critical to the community, which may require medical services.

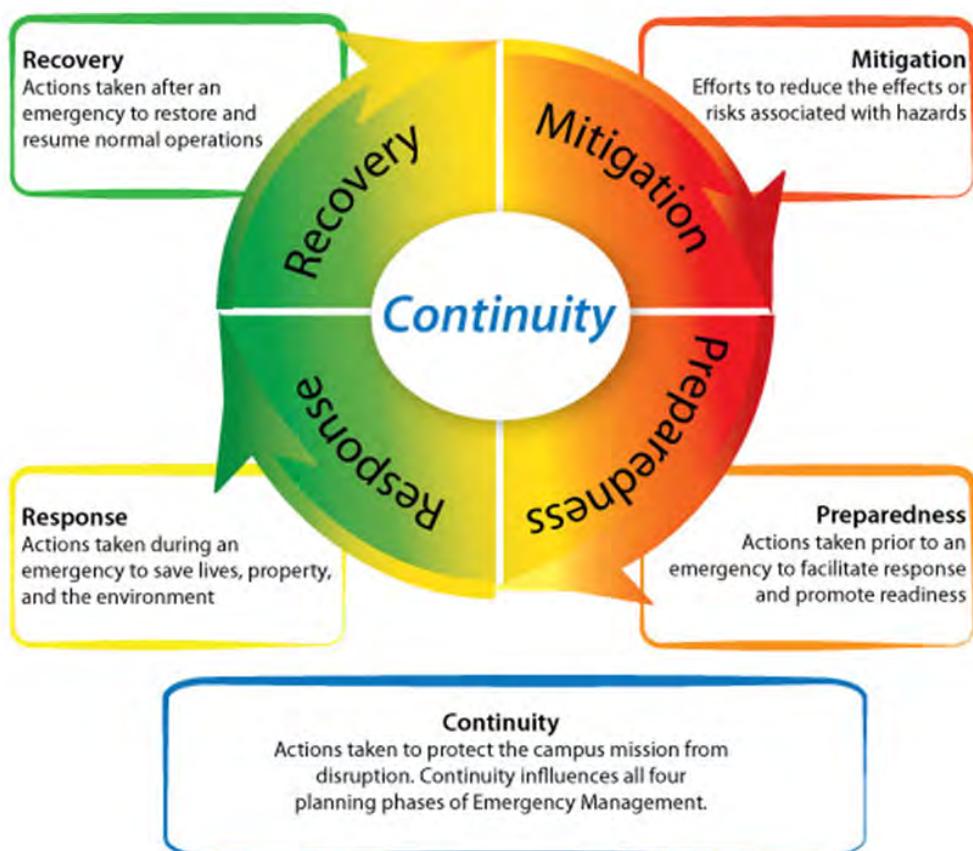
## Continuity Planning versus Emergency Preparedness

At first glance, continuity planning and emergency preparedness can be a daunting undertaking, especially for professionals who are unexpectedly saddled with those responsibilities. Within the national and state health care delivery systems, dedicated emergency managers typically exist only within hospital systems. In most workplaces, staff who have other primary day-to-day missions will complete the organization’s continuity and emergency planning.

Although these terms and processes overlap, they are quite different. The primary goal of emergency preparedness is to safeguard people and property from harm. Preparedness is a fluid and dynamic process that requires continual updates with adjustments. Continuity's main goal focuses on the continuation of key business or mission operations. Recognizing the difference permits the identification of different key tasks relating to the planning processes. Many businesses manage the two processes as one – a logical combination since both processes are working towards the same objective. However, this may not be the right decision for many organizations. Continuity cannot be fully addressed within the organization's emergency preparedness planning component.

Emergency preparedness plans may only provide a false sense of security from a continuity perspective and in many cases, may leave the business or organization vulnerable to irreparable damage. The 2017 letter to State Survey Agency Directors from the Centers for Medicare and Medicaid Services (CMS) delineated that the emergency plan is developed to support Continuity of Business Operations. The memo indicated that "an emergency plan provides the framework for the emergency preparedness program. The emergency plan is developed based on facility- and community-based risk assessments that assist a facility in anticipating and addressing facility, patient, staff and community needs and support continuity of business operation."<sup>4</sup> The memo further delineates the two processes by defining that continuity planning "generally considers elements such as: essential personnel, essential functions, critical resources, vital records and IT data protection, alternate facility identification and location, and financial resources" all of which are accurate assessments (see Figure 1).<sup>4</sup>

*Figure 1. Continuity Cycle's Influence within the Comprehensive Emergency Management Cycle<sup>5</sup>*



Depending on the organization's mission, a continuity plan should incorporate components of three continuity planning styles: Disaster Recovery (DR), Continuity of Operation Planning (COOP), and Business Continuity (BC). While they each have distinct nuances, emergency management professionals use the COOP and BC titles

and concepts interchangeably, falsely leading many to surmise that they share the same meaning and purpose. COOP and BC actually have fundamental differences in their role definition and planning methodologies. According to the Disaster Recovery Journal, the most notable difference between COOP and BC “is the ability of the organization to survive and the capability of the organization to recover from a disaster (see Figure 2).<sup>6</sup> COOP organizations expect they will do whatever is needed to meet the challenges of a disruption. There is no question they will remain operational during and after the event. BC organizations know they can fail. They seek to remain viable as an entity, with the understanding an unsuccessful recovery may force them to go under.”<sup>6</sup> There is value in understanding whether the organization needs a COOP or a BC plan.

*Figure 2. Disaster Event Cycle and Plan Overlap<sup>7</sup>*



## Continuity of Operations Planning (COOP)

COOP found its roots in civil defense planning, which dates back prior to World War II. In 1982, through executive order, President Ronald Reagan formalized U.S. government continuity planning in response to rising tensions from the Cold War with National Security Decision Directive 47 and 55. The “various measures were designed to ensure that the government of the United States would be able to continue operating after a nuclear war.”<sup>8</sup>

Governmental and public organizations should use the COOP process and terminology. These organizations plan with the assumption that in a disaster their mission is such that they cannot fail. Federal Continuity Directives written by the U.S. Department of Homeland Security (DHS) and FEMA outline the methodology for COOP. Presidential Policy Directive 40 outlines the program. Requirements are found within Federal Continuity Directives 1 and 2. President George W. Bush updated these policies with National Security Presidential Directive 51 and 20.9 Within the federal government and sometimes with state governments are the terms “Enduring Constitutional Government (ECG)” and “Continuity of Government (COG),” which refer to how the government will continue its command and constitutional powers during a disaster. An example of ECG and COG seen in popular culture is the television series, “Designated Survivor.” Although adapted for dramatic television, this example is a real process that often occurs when large portions of the government are in one location, such as during the State of the Union address. The only unclassified COG/CEG event in recent history occurred immediately after the September 11, 2001 attacks. Between 75 and 150 key senior federal government officials and other critical governmental workers from every executive department in Washington, D.C. were evacuated to secure bunkers known today as Raven Rock and Mount Weather Emergency Operations Center.<sup>8</sup>

Delaware state agencies, including DHSS and the Division of Public Health (DPH), maintain continuity of operations plans. On October 13, 2017, Governor John C. Carney signed and distributed Executive Order 15. Executive Order 15, a promulgation of the Delaware Emergency Operations Plan, stipulates that “each executive department or agency shall develop plans to ensure continuity of operations during times of emergency,

consistent with the requirements in the plan or as may be promulgated by the Secretary through the Delaware Emergency Management Agency to ensure its ability to carry out essential government functions in the aftermath of a disaster or emergency.”<sup>10</sup>

DPH’s Office of Preparedness works closely with DHSS divisions and DPH sections to ensure that continuity plans meet FEMA best practices. This ensures that each agency is prepared to recover their mission critical functions in a disaster. Validating plans and training for continuity is a vital part to a robust continuity program. In May 2019, DPH’s Emergency Medical Services and Preparedness Section performed a full-scale exercise for the DHSS COOP. Staff received an emergency notification that the primary office was impacted by an event and that all staff should report to the alternate facility. Approximately 50 staff relocated to the alternate facility, received Just-In-Time training, performed a turnover of the working space following the plan, and were able to demonstrate that essential mission functions could be performed. Three months later, senior leadership from all DHSS and DPH offices with disaster roles participated in a facilitated tabletop exercise to validate each representative’s plan (*see Image 1*). The attendance by each group’s senior leadership allowed for high-level plan review and validation. DHSS and DPH leadership are committed to ensuring that their agencies maintain a robust continuity program to minimize the impact to the communities they serve.



*Image 1. Delaware Department of Health and Social Services (DHSS) and Delaware Emergency Management Agency (DEMA) staff discuss continuity relocation to alternate facilities during an August 13, 2019 COOP tabletop exercise. Pictured from left: Division of Public Health (DPH) Deputy Director Crystal Webb, DHSS Deputy Secretary Molly Magarik, DEMA Principal Planner Tony Lee, DPH Director of Preparedness Timothy Cooper, and Chief of DPH’s Emergency Medical Services and Preparedness Section Steve Blessing. Photo Credit: Eric Donato, EMSPS.*

FEMA provides a wide variety of COOP training and programs that are free of cost and can be applied to the public and private sector organizations.

## **Business Continuity (BC)**

Private industry, including health care, largely uses BC. BC generally looks inward and focuses on preserving the organization, keeping it in business and generating revenue. BC and what is now known as modern Emergency Management were “both born, in part, from the California forest fires of the early 1970s. The Incident Command System (ICS) was formalized in that crucible by the National Fire Prevention Association (NFPA). So was the NFPA-1600 standard, the first standard dedicated solely to BC.”<sup>6</sup> The other major delineation is that BC is formed from the ground level up compared to COOP, which by design is a top-down approach to planning and execution. Resources and money limit business continuity. Applying a top-down COOP model and process designed for government may be inappropriate for a business as these models assume few or no limits to recovery resources.<sup>6</sup> Private businesses should factor costs, profits, and losses in their BC planning; their business goal is to remain viable and an unsuccessful recovery could result in going out of business.

## **Disaster Recovery (DR)**

DR is a subset of business continuity planning that focuses on communication, hardware, and other Information Technology (IT) assets. DR’s goal is to minimize a business’s downtime by quickly restoring technical operations. DR incidents range from a small computer malfunction to a large data breach of a records system.

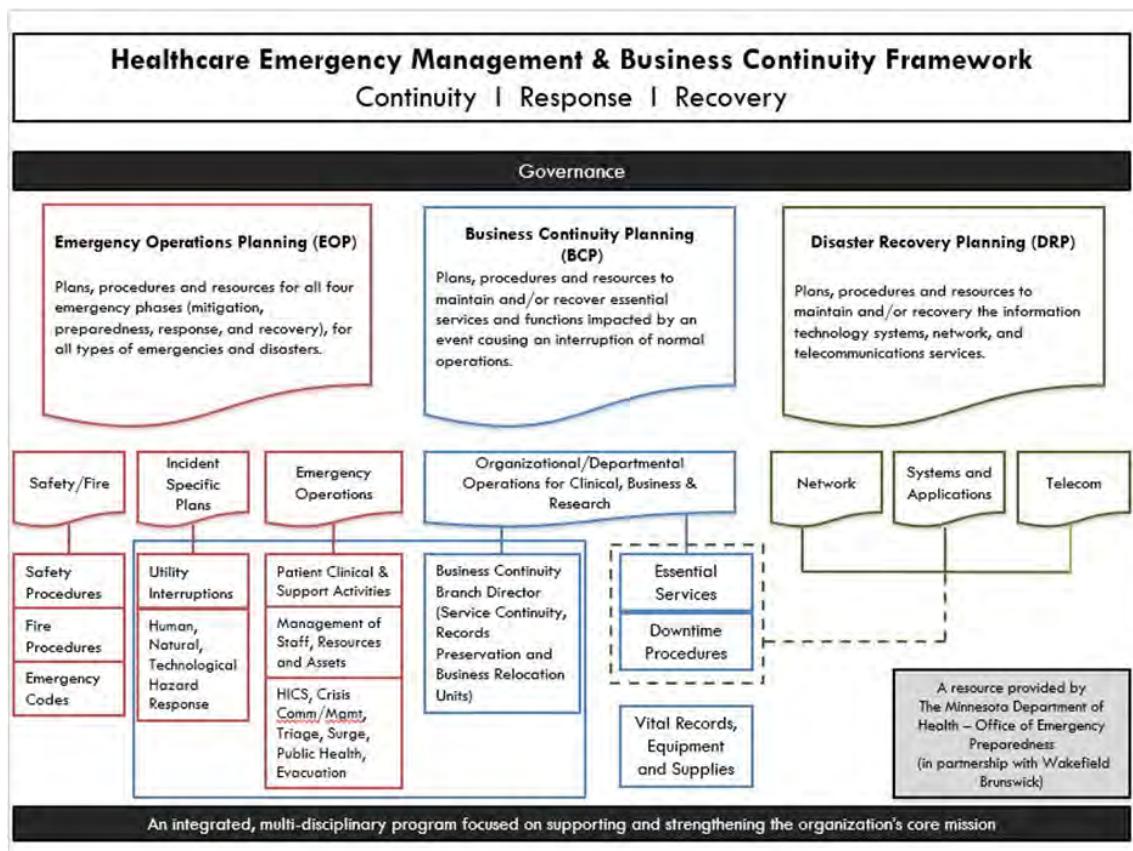
Data and health care are inseparable in today’s world of telemedicine and electronic patient records. Findings from the U.S. Department of Health and Human Services (HHS) found that “based upon data collected by the HHS Office for Civil Rights, as of February 1, 2016, protected health information breaches affected over 113 million individuals in 2015. In 2015, hacking incidents comprised nearly 99 percent of all individuals affected by breaches, and the number of reported hacking incidents, 57, comprised over 20% of all reported breaches.”<sup>11</sup>

## **CMS Emergency Preparedness Rule and Continuity**

The final rule on emergency preparedness requirements for Medicare and Medicaid participating providers and suppliers took effect in 2017.<sup>4</sup> Its intent was to establish an all-hazards, risk-based, community-integrated approach to emergency preparedness planning that ensures health care facilities can handle a wide spectrum of disasters. The rule came almost a decade after Hurricane Katrina, which in 2005 devastated New Orleans, Louisiana and demonstrated the fragility and unready posture of the government at the local, state, and federal levels as well as the health care system overall. The tragedies that took place after Katrina’s landfall, including those at Memorial Medical Center, have shaped today’s private health care and public health emergency preparedness.

Like other states, the Delaware health care system is comprised of a diverse and vast network of providers and services. In theory, the system can easily absorb the loss of a single provider or site, but becomes strained when multiple providers are unable to reopen after an event. When a system faces pre-disaster challenges, a network with fewer providers is less capable of responding to, and recovering from, an event. Health care organizations should implement the CMS rules as the minimum foundation, as meeting the standard should not be reason to remain static. The CMS emergency preparedness rule does mean more preparedness, but a continual process of improvement should be implemented. Businesses can only make money and survive if they are able to provide services or deliver goods. The health care delivery system can only survive only if each network partner is operating effectively. The steps taken to improve an organization’s continuity will pay dividends when disaster strikes and very well may be the difference in life and death for community members. When Hurricane Katrina hit New Orleans, “roughly 300 deaths were recorded at hospitals, long-term care facilities and in nursing homes according to a recently published study of death certificates and disaster mortuary team records.”<sup>12</sup> At every level, the health care industry has a moral obligation to their patients and customers to continuously improve their readiness (*see Figure 3*).

*Figure 3. Healthcare Emergency Management and Business Continuity Framework<sup>13</sup>*



## Continuity Program Foundations: Where to Begin

BC and COOP are specific plans, procedures, and resources that allow a health care organization to recover their essential services and functions during an event that disrupts normal operations. Organizations that meet the CMS emergency preparedness guidelines may not have a robust BC plan. To champion continuity with an organization, follow the five best foundational practices:

### 1. Gain organization leadership buy-in.

Before seeking leadership support, research BC or COOP in health care, and participate in continuity courses. Many of the BC and COOP mitigation measures, such as creating a staff contact roster, can be performed at little to no cost. Remember that the goal of BC is self-preservation. Can your organizational leadership afford to do nothing?

### 2. Establish a BC or COOP planning team.

Establish a strong internal planning team with staff that have preparedness mindsets. Regardless of its size, the team should represent all critical elements: clinical operations, non-clinical operations, and specialties like human resources or IT.

### 3. Identify one executive or leader with authority to serve as project manager.

To avoid isolated efforts and to embrace cross-functional planning, one executive or leader with authority should function as the overall project manager. The project manager ensures that collaboration occurs, deadlines are met, and the project maintains forward progress, in addition to resolving conflicts.

4. *Perform a BC Risk Assessment or COOP Threat and Hazard Identification and Risk Assessment (THIRA).* The first step to performing a BC Risk Assessment or COOP THIRA is to understand what risks exist. This process is likely simpler than most would think, as most emergency management agencies and public health agencies are required by their grants to perform risk assessments for their jurisdictions. Many are available online; however, if one cannot be located for your area, contact the state or local public health preparedness office or emergency management agency. The risk assessment should identify threats or hazards with opportunities for hazard prevention, deterrence, or risk mitigation.

##### 5. For BC Perform a Business Impact Analysis (BIA)

A BIA predicts the consequences of disruption of a business function or process and gathers information needed to develop a recovery strategy. Considering potential operational and financial impacts, the BIA should include other outcomes such as regulatory fines, contractual penalties, and customer dissatisfaction. Factor in the timing and duration of disruption, as these variables can alter the impact to the business. The BIA will be used to establish priorities to restore business operations.

The five foundations are a starting point in the journey to continuity. When continuity planning is incorporated into the culture of an organization, a shift occurs in which business and operational decisions are made based on risk, mitigation, and resiliency, placing the organization in the best position to avert disaster (*see Figure 4*).

#### Advice for Small Health Offices with Limited Resources

From dental offices to FQHCs, small health offices provide critical community services. A disruption to their operations or their inability to recover can result in business failure and a loss of those community resources. Small health offices can follow these four recommendations when developing a comprehensive continuity plan:

##### 1. Develop a staff, vendor, and other critical personnel rosters.

Include home and cell phone contact numbers and electronic messaging information, as well as contact information for service providers, insurance companies, landlords, and others. Inform staff how they will be contacted in the event of an emergency. When a disaster strikes, the first action will be to get information to staff and

Figure 4: Business Continuity Infographic<sup>3</sup>



critical partners. These rosters should be easily accessible and stored at an off-site location in addition to the business.

## **2. Develop an order of succession for the organization.**

Operations should not come to a complete stop if one person is unavailable. If the organization's decision maker is unavailable or incapacitated, is there clear guidance that indicates who is authorized to perform those duties, roles, and responsibilities? Orders of succession are provisions for the assumption of senior leadership positions during an emergency when the incumbents are unable or unavailable to execute their legal duties.

When possible, have the order of succession at least "three deep," meaning that if the head leader of the organization was incapacitated, identify two others who could perform that role functions in an emergency. Emergencies and disasters can be stressful times, so identifying succession orders in advance provides your staff and organization clear guidance on roles and responsibilities.

## **3. Delegation of authority should complement succession planning.**

Delegation of authority specifies who is authorized to make decisions and act on behalf of leadership and other key personnel for specific purposes during emergencies. Although similar to succession planning, delegation of authority encompasses a task rather than a position, i.e. approving timesheets.

## **4. Set small achievable goals.**

Choose one idea this article sparked in your mind, write a small goal to work towards, and commit to achieving it within the next 30 days. When that and other goals are reached, celebrate and thank staff. Every preparedness action taken, no matter how small, makes a business better prepared than the day before.

## **Continuity Training Opportunities**

FEMA offers training opportunities at no cost, including wide varieties of online independent study courses and one-, two-, and three-day in-person courses specific to continuity. FEMA Continuity courses are periodically offered directly through the Delaware Emergency Management Agency. FEMA also offers two levels of professional certification for continuity: the Professional and Master Continuity Practitioner. The continuity certifications provided through FEMA, including the proctored examination, are provided free of charge. Visit <https://www.fema.gov/continuity-excellence-series-professional-and-master-practitioner-continuity-certificate-programs>.

Disaster Recovery Institute (DRI) International is a nonprofit that helps organizations around the world prepare for and recover from disasters by providing education, accreditation, and leadership in business continuity and related fields. The organization holds an annual conference and has a variety of training specific to business continuity and disaster recovery. DRI also offers a variety of professional certification for business continuity, most notably the Certified Business Continuity Practitioner and a new Certified Healthcare Provider Continuity Professional program. DRI training and certification have associated costs. Visit <https://drii.org>.

## **Continuity Resources**

Varieties of resources exist to help both public and private sector organizations build continuity. The NFPA 1600 Standard on Continuity, Emergency, and Crisis Management contains a large variety of resources to help meet compliance with Joint Commission Standards and CMS Emergency Preparedness rules. Read a crosswalk of the CMS Emergency Preparedness Final Rule to NFPA 1600 at <https://www.team-ihc.org/files/non-gated/quality/cms-emerg-preparedness-crosswalk.aspx>.

FEMA's Continuity Resource Toolkit contains information, templates, development guides, exercises, and more at no cost. Visit <https://www.fema.gov/continuity-resource-toolkit>.

The DHS Business Continuity Planning Suite provides instructional videos that provide guidance for BC development; visit <https://www.ready.gov/business-continuity-planning-suite>. Their business section's

testimonials can be shared with organizational leadership to help establish buy-in.

When organizations within the health care delivery systems develop a continuity program, they will likely incorporate both COOP and BC components. The degree to which these components are incorporated is dependent on the organizational choice of a more top-down COOP response focus or a bottom-up BC recovery focus. When former U.S. Assistant Secretary of Defense for Homeland Security Dr. Paul Stockton discussed preparedness and continuity, he stated: “It’s not rocket science, it’s not fear mongering, it is being sensible about where we buy down risk against a whole class of threats.”<sup>14</sup>

Every Delaware health care business should be familiar with all potential threats to their business operations, from a flood to a flu pandemic. Businesses and organizations should remember, “Throughout history there always has been a moment in the life of every problem where it was big enough to be seen and still small enough to be addressed.”<sup>14</sup> To avoid financial hardship, businesses should invest in continuity planning now or risk difficult or impossible recoveries. Regardless of an organization’s role in the health care delivery system, continuity and organizational resilience is critical for the recovery of individual organizations after a disaster, as well as for the recovery of the health care system as a whole.

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*The Delaware Public Health Association was officially reborn at the 141<sup>st</sup> Annual Meeting of the American Public Health Association (APHA) held in Boston, MA in November, 2013. At this meeting, affiliation of the DPHA was transferred to the Delaware Academy of Medicine officially on November 5, 2013 by action of the APHA Governing Council. The Delaware Academy of Medicine, whose mission statement is "to promote the well-being of our community through education and the promotion of public health," is honored to take on this responsibility in the First State.*