



# Ebola Biosafety and Infectious Disease Response Worker Training Program

## A Multisector, All-Hazards Approach to Biosafety Preparedness



Health care practitioners in an operations-level training at the Regional Medical Center in Anniston, Alabama. (Photo courtesy of UAB)

The [NIEHS Worker Training Program \(WTP\)](#) is implementing infectious disease response training for workers across sectors who may be exposed to infectious diseases. This addresses an important gap revealed by the 2014 Ebola outbreak.

The Ebola Biosafety and Infectious Disease Response WTP began June 1, 2016, and will run through May 31, 2019. NIEHS is building federal capacity for biosecurity, biopreparedness, and rapid response to emerging infectious diseases, including developing an infrastructure of trainers and organizations who can be a resource during emergencies.

NIEHS launched the program with the following federal agencies:

- Centers for Disease Control and Prevention (CDC)
- U.S. Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response
- National Institute of Occupational Safety and Health
- Occupational Safety and Health Administration

The program is funded through a \$10 million transfer to NIEHS WTP via CDC using Ebola emergency supplemental appropriations.

## Program Accomplishments as of May 31, 2018:

Approximately **1,000 courses** to **23,000 workers**, with more than **90,000 contact hours**, and in-person trainings in **37 states** across the country.

Approximately **65 train-the-trainer and trainer development courses** were provided to more than **900 workers** across the country to become trainers or increase their capacity to train.

More than **40 new curricula** are available in the [NIEHS WTP Clearinghouse Curricula Catalog](#).

The curricula include:

- Hands-on skills and adult learning techniques.

- Continuing education credits across several specialties.

- Approval or integration into state and national organizations.

## Occupations Trained:

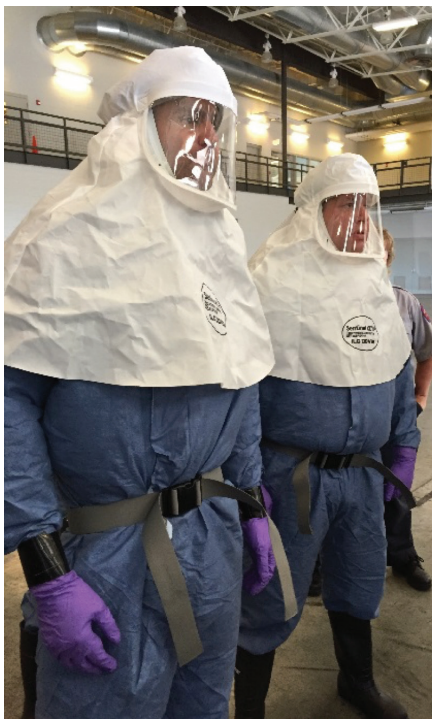
- Airport/airline workers
- Construction workers
- Corrections workers
- Custodial/environmental service workers
- Death care workers
- EMS and first responders
- Health care workers
- Homeless outreach teams
- Military personnel
- Nail salon technicians
- Occupational health and safety professionals
- Public health workers
- Security and customs workers
- Volunteers/disaster workers
- Vulnerable populations

**94% of training participants** across a variety of courses agreed or strongly agreed that the training prepared them to recognize infectious disease hazards on the job, and **93% agreed or strongly agreed** that the training prepared them to safely respond to infectious disease events on the job.\*

\*Data from four grant recipients using common evaluation questions.



UMET trains health professionals on PPE for infectious diseases in San Juan, Puerto Rico. (Photo courtesy of NJ/NY Hazardous Materials Worker Training Center)



Firefighters at the Omaha Fire Department are trained on PPE by University of Nebraska, consortium member under Indiana University Bloomington. (Photo courtesy of Jonathan Rosen)

## Building Capacity for Infectious Disease Response Across the Country

Grant recipients are developing and delivering evidence-based infection control and hazard recognition training to worker populations they can access through labor unions and partnerships. By learning how to protect themselves during an outbreak, these workers become part of a preventive strategy which helps keep their worksites and communities safe.

Each grant supports a consortium with subgrants to expand their reach to more states and worker populations. The eight primary grant recipients are:

- Biosafety and Infectious Disease Training Initiative (BIDTI) at Indiana University Bloomington
- Deep South Biosafety WTP at The University of Alabama at Birmingham (UAB)
- Duke Infectious Disease Response Training Program (DIDRT) at Duke University

- Emory Ebola Biosafety and Infectious Disease Response WTP at Emory University
- International Chemical Workers Union Council (ICWUC) Center for Worker Health and Safety Education
- Laborers' International Union of North America (LIUNA) Training and Education Fund
- New Jersey/New York (NJ/NY) Hazardous Materials Worker Training Center at Rutgers University
- United Steelworkers Tony Mazzocchi Center (USW TMC)

The Ebola Biosafety and Infectious Disease Response WTP builds off the overall NIEHS WTP, with its 30-year history of hazardous waste worker and emergency response training across the country, responsiveness to federal regulations and guidance, and strong position on and training in infectious disease response over approximately two decades.

# Training Highlights

Below are training highlights from NIEHS grants as of May 31, 2018.



## Health Care Workers, Faculty, and Students

### Deep South Biosafety WTP, with consortium member The University of Mississippi Medical Center (UMMC)

STATES: Alabama, Mississippi

This program has offered awareness- and operations-level courses in Mississippi and Alabama to a variety of sectors and occupations at hospital-based institutions, and has published [resources](#) such as personal protective equipment (PPE) checklists and a train-the-trainer best practices guide. For refresher courses, UMMC and UAB offer simulation training, allowing participants to get further hands-on experience. UAB and UMMC have also trained faculty and students from schools of nursing across Alabama and Mississippi.

### DIDRT, with consortium members University of Louisville and George Mason University (GMU)

STATES: Kentucky, North Carolina

DIDRT's training in the health care and academic health center sectors includes training Duke University clinical microbiology lab workers, stem cell transplant lab workers, Duke Human Vaccine Institute lab workers, and Duke University Spill Response Team members. Under DIDRT, University of Louisville launched an operations-level training for third-year nursing students. This training has been incorporated into the school's nursing curriculum for students preparing themselves for the clinical setting.

### USW TMC, with consortium member Communications Workers of America (CWA)

STATES: California, Illinois, New York

USW TMC and CWA have both trained health care union members through this consortium. USW TMC conducted a train-the-trainer program to certify a cadre of trainers for the USW health care sector. Additionally, University Professional and Technical Employees (UPTe)/CWA Local 9119 and CWA's Occupational Safety and Health Department conducted infectious disease safety and health training sessions for CWA-represented employees at University of California medical centers (designated Ebola Treatment Centers).

### NJ/NY Hazardous Materials Worker Training Center, with consortium member Universidad Metropolitana (UMET)

TERRITORY: Puerto Rico

UMET supports responders to disasters and outbreaks through their training in Puerto Rico. UMET provided four-hour PPE for Infectious Diseases courses to responders, facilitating knowledge and skills development in the selection, putting on, and removal of PPE.



University of Louisville nursing students participate in an operations-level training. (Photo courtesy of DIDRT)



First responders learn strategies for safe transport of potentially infectious patients from the Emory Ebola Biosafety and Infectious Disease Response WTP in Atlanta, Georgia. (Photo courtesy of Jonathan Rosen)



Workers in a pre-apprenticeship program at the Cypress Mandela Training Center in Oakland, California, participate in an infectious disease awareness course. (Photo courtesy of ICWUC)



## Emergency First Responders

### Emory Ebola Biosafety and Infectious Disease Response WTP

**STATES:** Florida, Georgia, Nebraska, South Carolina, national reach

Emory is working closely with large national emergency response partners American Medical Response and Air Methods Corporation. Through these partnerships, more than 4,800 awareness courses have been completed across the country. Additionally, operator- and technician-level courses have been taught in Georgia, Florida, South Carolina, and Nebraska. Emory's training is reaching transport providers in critical places, such as the Hartsfield-Jackson Atlanta International Airport, which has an on-site quarantine station and could be involved in transport to the Emory Ebola Treatment Center.

### DIDRT, with consortium member GMU

**STATES:** District of Columbia, Virginia, Washington

DIDRT is training both rural and urban firefighters to prepare for potential exposures to infectious pathogens. GMU conducted an exercise for the Fauquier County Fire Department in Warrenton, Virginia, where the firefighters had to respond to and transport a simulated sick patient from a residence during an epidemic. Under GMU's leadership, the entire DIDRT consortium will provide infectious disease response training

to roughly 1,500 Washington, D.C., fire and emergency medical services (EMS) personnel in the 2018-2019 program year. In addition, GMU trained the Spokane Ebola Response Team with American Medical Response, facilitated by the Washington State Region 9 Healthcare Coalition. This first responder team is responsible for the medical transport of highly infectious patients.

### Deep South Biosafety WTP, with consortium member Alabama Fire College Workplace Safety Training (AFC WST)

**STATES:** Alabama, Mississippi

AFC WST trains first responders in the Southeast, focusing on firefighters and EMS in Alabama and Mississippi. AFC WST delivers both infectious disease awareness and operations courses to fire department employees, such as the Vestavia and Pelham Fire Departments outside Birmingham, Alabama.



## Construction Trades and Workforce Development

### LIUNA Training and Education Fund

**STATES:** Iowa, Louisiana, Michigan, New Jersey, New York, Pennsylvania

LIUNA Training is preparing construction craft laborers to work safely in hospital or other health care settings or to conduct cleanup, decontamination, and disinfection activities following an infectious disease incident. LIUNA Training is also delivering Infection

Control Risk Assessment (ICRA) training. ICRA is required by health care facilities and employers for on-site construction projects to protect against pathogens spreading via construction dust or workers encountering contaminated surfaces or airborne pathogens.

---

## ICWUC

STATE: California

In Oakland, trainers at the Cypress Mandela Training Center taught eight infectious disease awareness courses to almost 150 students as part of the center's pre-apprenticeship program. Many graduates go on to jobs in the skilled trades. The courses were supported through ICWUC's partnership with the Coalition of Black Trade Unionists.



## Disaster Preparedness, Response, and Recovery

---

### NJ/NY Hazardous Materials Worker Training Center, with consortium member World Cares Center (WCC)

STATE: New York

WCC supports volunteer work for disasters or outbreaks. For their infectious disease program, WCC provides resiliency courses as well as experiential/hands-on training as a follow-up to awareness classes on Zika and resiliency. WCC has also held a series of trainings for the disaster response team at John Jay College of

Criminal Justice in New York, New York. Topics included Ebola, resiliency, Zika, and hands-on follow-up.

---

## 2017 Hurricane Response

Many NIEHS grant recipients provided training to workers in response to the 2017 hurricane season and the infectious disease hazards posed during cleanup and recovery. Some delivered train-the-trainer courses, which allows for local dissemination of infectious disease safety information.

---

### ICWUC, with consortium members American Federation of State, County, and Municipal Employees (AFSCME); National Nurses United (NNU); American Federation of Teachers (AFT); and National Council for Occupational Safety and Health (NCOSH)

STATES/TERRITORY: Florida, Puerto Rico, Texas

ICWUC consortium members have many union members and local partners in hurricane-affected areas who need ongoing training and PPE to protect themselves during cleanup. AFSCME, NNU, and AFT delivered disaster training that included infectious disease concepts to their members either in Puerto Rico or traveling there to volunteer. ICWUC also partnered with University of Puerto Rico to train graduate students. ICWUC conducted infectious disease train-the-trainer courses in Fort Lauderdale, Florida, for NNU and in Houston, Texas, for the NCOSH local partner.

---

## USW TMC

STATE/TERRITORIES: Puerto Rico, Texas, U.S. Virgin Islands

After deploying emergency response training teams to hurricane-affected regions, the need for infectious disease awareness training for hurricane survivors became apparent. USW TMC will conduct an infectious disease train-the-trainer course for 20 team members in the third program year, preparing them for future deployments.

---

### Emory Ebola Biosafety and Infectious Disease Response WTP

STATE/TERRITORY: Kentucky, Puerto Rico

As a partner with Emory through the Region IV Public Health Training Center, University of Louisville trainers prepared electrical linemen working for Louisville Gas & Electric/Kentucky Utilities prior to disaster relief work in Puerto Rico. The group was chosen to restore power to remote areas of the island following the devastation of Hurricane Maria.



University of Puerto Rico students and AFSCME members in San Juan take part in a PPE exercise to protect themselves during disaster cleanup. (Photo courtesy of ICWUC)



PPE practice session during an operations-level training with the Alabama State Mortuary Operations Response Team in Tuscaloosa, Alabama. Training was provided by UAB. (Photo courtesy of UAB)



EVS managers and staff of the Indiana casino and resort participate in community-level training from Indiana University Bloomington. (Photo courtesy of BIDTI)



## Death Care

### Deep South Biosafety WTP

STATE: Alabama

The program delivered awareness, operations, and train-the-trainer courses to the Alabama State Mortuary Operations Response Team (SMORT), a group of volunteers who meet and train annually to prepare for a response to a potential mass casualty event. The occupations trained included a forensic pathology specialist, funeral directors and coroners, and representatives from emergency management agencies.

### BIDTI

STATES: Illinois, Ohio

BIDTI trained senior students at Worsham College of Mortuary Science in Wheeling, Illinois, to provide infection control information specific to the mortuary industry. The training was for those who might handle highly infectious deceased bodies, instilling good practices before graduates enter the workforce. BIDTI also provided a session at the Ohio Embalmers Association professional embalmer seminar.



## Environmental Service (EVS) Workers, Sanitation Workers, and Domestic Cleaners

### LIUNA Training and Education Fund

STATES: District of Columbia, Texas

LIUNA Training instructors trained service employees who are primarily janitorial, housekeeping, and food service workers in large government facilities, often Veterans Affairs hospitals. These EVS workers in hospitals or other settings generally do not have the opportunity for infection control education and PPE trainings. The joint labor-management Service Contract Education and Training Trust Fund facilitated the training.

### USW TMC, with consortium members National Day Laborer Organizing Network (NDLON) and Make the Road New York (MRNY)

STATE: New York

NDLON affiliate Wind of the Spirit conducted 21 classes in year two, reaching more than 500 people engaged in a wide range of work, including cleaning, sanitation, highway cleaning, and portable sanitary relief maintenance. MRNY conducted additional classes for participants primarily from Latino immigrant communities. These workers come from a variety of jobs, including domestic and commercial cleaning workers, private trash collectors, and laundry workers. These training sessions help participants maintain their job

or obtain jobs that require infectious diseases training, and understand their rights as workers and the responsibilities of employers.

## BIDTI

STATES: Indiana, Kentucky

BIDTI trained EVS managers and staff of a large hotel and casino resort in southern Indiana that is frequented by residents of surrounding Midwest states. BIDTI also trained EVS workers, as well as all aircraft rescue and firefighting personnel, based at Indianapolis International Airport.



## Homeless Outreach and Substance Abuse Prevention Workers

### BIDTI, with consortium member Harvard University

STATES: Indiana, Massachusetts

BIDTI is training homeless coalitions and communities, substance abuse councils, and street outreach teams that encounter many individuals with injection drug use problems and associated infectious diseases in Indiana, and has trained staff from a domestic women's shelter in Massachusetts. These training efforts can address the spread of infectious diseases associated with the opioid epidemic and Indiana's increased incidence rates of hepatitis C and hepatitis C/HIV co-infection, while teaching skills transferable to a highly infectious disease scenario.



## Nail Salon Technicians

### NJ/NY Hazardous Materials Worker Training Center, with consortium member New York Committee for Occupational Safety and Health (NYCOSH)

STATE: New York

NYCOSH is delivering five-day infectious disease training courses for nail salon technicians that cover the multiple infectious hazards faced on the job, such as fungal infections, bacterial infections, and other blood-borne pathogens. The courses also address methods of infection control and demonstrate the use of PPE with hands-on activities. The training has been delivered in Spanish and Nepalese in New York City, with courses in Korean planned for the third program year.



Nail salon technicians learn about infection control and PPE in a training from NYCOSH. (Photo courtesy of NJ/NY Hazardous Materials Worker Training Center)



## Military

### LIUNA Training and Education Fund

STATES: California, Michigan, national outreach

LIUNA Training provided three infectious disease awareness courses for 43 National Guard Reserve members of LIUNA Local 1776. These reserve members gained skills for potentially hazardous situations, such as being deployed to areas with inadequate sanitation or to disaster sites. Ten members were trained at the Michigan Laborers Training and Apprenticeship Institute, and the rest were trained at a National Guard conference in southern California.



## Airline and Airport Workers

### ICWUC, with consortium member University of Minnesota

STATE: Minnesota

University of Minnesota is delivering infectious agents training to cabin cleaners, flight attendants, and maintenance personnel from two airline companies, Sun Country Airlines and Global Aviation Services. The workers are learning about infectious agents, biological hazards, and PPE that can be used for a biological response in a workplace setting.

### USW TMC, with consortium member CWA

STATES: Illinois, Texas

CWA is training passenger agents and flight attendants on infectious disease health and safety. For passenger agents, they are working with American



Training for Sun Country Airlines cabin crew by University of Minnesota (UMN). (Photo courtesy of UMN)

Airlines, Envoy Air, and Piedmont Airlines. The CWA Occupational Safety and Health Department works with the Association of Flight Attendants (AFA)-CWA trainers to conduct training sessions for flight attendants. AFA-CWA represents 50,000 flight attendants employed by over 25 airline companies.



## Public Health Workers

### Emory Ebola Biosafety and Infectious Disease Response WTP

STATES: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee

Emory is partnered with the Health Resources and Services Administration Region IV Public Health Training Center to provide training for public health personnel at or associated with state or local health departments, as well as health care workers who practice in rural areas of the United States and are supported by Area Health Education Centers. The Public Health Training Center offers serious contagious disease awareness and hands-on education and training.

### DIDRT

STATES: North Carolina, Tennessee

DIDRT trains both county and state health department employees at the operations and train-the-trainer level. Various worker populations at the Stokes County, North Carolina, health department have been trained (such as nurses, custodial, and maintenance) and six workers completed a train-the-trainer course. Twenty workers at the Tennessee State Department of Health completed operations-level training.

### NJ/NY Hazardous Materials Worker Training Center

STATE: New Jersey

Rutgers University delivered two four-hour PPE for Infectious Disease courses for public health students and professionals. Additionally, they have been using social media to disseminate key public health messages in collaboration with the State of New Jersey Department of Health, such as providing a [Facebook Live event](#) on "Flu Facts."



## Occupational Health and Safety Professionals

### BIDTI, with consortium member The University of Texas Health Sciences Center at Houston (UTHealth)

STATES: Texas, national reach

UTHealth delivered a webinar on tuberculosis to over 100 occupational professionals and physicians at ExxonMobil campuses nationwide. UTHealth also delivered a full-day, operations-level training at the American Bio Recovery Association national conference, a gathering of professionals who mitigate and clean up conditions resulting from the release of biological hazards.





The Fauquier County Fire Department participates in a GMU training in Warrenton, Virginia. Trainees are responding to a simulated sick patient with a mock ambulance. (Photo courtesy of DIDRT)

# Challenges and Unmet Needs

## In 2015, NIEHS published “Ebola Biosafety and Infectious Disease Response Training: Needs Assessment and Gap Analysis for the NIEHS Worker Training Program.”

The report discusses gaps in integration between public health, medical, occupational health, and worker safety activities; minimal protective guidance informing the full spectrum of workers; and the difficulty of sustaining a high level of readiness and worker competency.

The training and partnerships developed in the program are addressing areas of integration and are building capacity across the country, but there are continued unmet needs and challenges for worker training in the field.

Grant recipients reported two common challenges:

1. There is less motivation from organizations when highly infectious pathogens are not in the news.

*“The threat of high consequence infectious disease exposure is always present, but public and employer interest in providing dedicated education and training can wane absent a high visibility public health emergency.”*

*“...both the general worker who may casually come into contact with pathogens and the worker who may respond to a disaster or highly hazardous situation tend to disregard opportunities for training until it becomes necessary...”*

2. It is difficult for organizations and workers to commit to the longer courses that are needed for operations-level training. In some cases, it is even difficult for them to commit to the shorter awareness-level training.

*“Feedback from many organizations that did accept our trainings last year stated they thought the topic of biosafety and infectious disease was important, but they could not afford for their workers to attend a full-day or multi-day training.”*

*“Some populations strongly desire training and yet can’t access it even when it is available. This cannot easily be solved, as work obligations limit opportunities.”*

Lessons learned on confronting and overcoming these challenges will be summarized at the end of the program.

## Hospital, Medical, and Emergency Response Training Needs

Hospital staff and EMS have an ongoing need for continued capacity building through operations-level training, refresher training, and drills.

A 2017 [research article](#) and [commentary](#), both written by authors from BIDTI, discussed how funding gaps and other issues have led to a lack of capacity to fully address a highly infectious pathogen outbreak, with a lack of adequate ongoing and nationally coordinated training contributing to this gap.

## Training Needs for Non-health Care Sectors

Certain occupations, such as environmental cleaners and construction workers, have few other options for gaining knowledge on highly infectious pathogens, especially in more vulnerable populations such as immigrant workers.

Under separate funding, authors from BIDTI surveyed individuals from several sectors to assess training needs around potential exposure to highly infectious agents. Their gap analyses found industry-specific education, training, and policy needs in all the populations surveyed: [medical waste](#), [death care](#), [EMS](#), and [US Aircraft Rescue and Fire Fighting members](#).

## Training on the Aerosol Transmissible Disease (ATD) Standard

NIEHS, under separate funding, supported the development of a curriculum that trains nurses on the California ATD Standard, which provides protections against diseases transmitted by fine particles suspended in air. The [curriculum is available for dissemination](#) and could be expanded or tailored to other states to help address the lack of national regulation or guidance in this area.

# Efforts at Sustainability

Training efforts have resulted in several outcomes that address sustainability of the training once the funding is over:

- Permanent integration of curriculum into health care or EMS training program requirements or options.
- Certification of training courses by various continuing education organizations.
- Integration and availability of modules and content under other hazardous waste worker and emergency response training programs, as employers request.



Construction craft laborers learn how to protect themselves against exposure to infectious pathogens. (Photo courtesy of LIUNA Training)



## Journal Articles and Commentaries

Yeskey K, Hughes J, Galluzzo B, Jaitly N, Remington J, Weinstock D, Lee Pearson J, Rosen JD. 2017. Ebola virus training: a needs assessment and gap analysis. *Health Secur* 15(3):225-229.

*The following articles and commentary, written by authors from BIDTI, were completed under separate funding. The papers contributed to the development of NIEHS-funded training courses, discussed the national role of the NIEHS Ebola Biosafety and Infectious Disease Response Worker Training Program, or acknowledged the support of NIEHS funding in highlighting the need to understand training gaps in specific worker populations.*

Le AB, Hoboy S, Germain A, Miller H, Thompson R, Herstein JJ, Jelden KC, Beam EL, Gibbs SG, Lowe JJ. 2018. A pilot survey of the U.S. medical waste industry to determine training needs for safely handling highly infectious waste. *Am J Infect Control* 46(2):133-138.

Le AB, Buehler S, Maniscalco PM, Lane P, Rupp LE, Ernest E, Von Seggern D, West K, Herstein JJ, Jelden KC, Beam EL, Gibbs SG, Lowe JJ. 2018. Determining training and education needs pertaining to highly infectious disease preparedness and response: a gap analysis survey of US emergency medical services practitioners. *Am J Infect Control* 46(3):246-252.

Le AB, Herron R, Herstein JJ, Jelden KC, Beam EL, Gibbs SG, Lowe JJ, Smith T. 2018. A gap analysis survey of US Aircraft Rescue and Fire Fighting (ARFF) members to determine highly infectious disease training and education needs. *Disaster Med Public Health Prep* 21:1-5; doi:10.1017/dmp.2017.142.

Le AB, Biddinger PD, Smith PW, Herstein JJ, Levy DA, Gibbs SG, Lowe JJ. 2017. A highly infectious disease care network in the US healthcare system. *Health Secur* 15(3):282-287.

Le AB, Witter L, Herstein JJ, Jelden KC, Beam EL, Gibbs SG, Lowe JJ. 2017. A gap analysis of the United States death care sector to determine training and education needs pertaining to highly infectious disease mitigation and management. *J Occup Environ Hyg* 14(9):674-680.



National Institute of  
Environmental Health Sciences  
*Worker Training Program*

For more information on the NIEHS Ebola Biosafety and Infectious Disease Response Worker Training Program, visit:  
[https://www.niehs.nih.gov/careers/hazmat/about\\_wetp/ebola/index.cfm](https://www.niehs.nih.gov/careers/hazmat/about_wetp/ebola/index.cfm).