Ebola Biosafety and Infectious Disease Response Worker Training Program

A Multisector, All-Hazards Approach to Biosafety Preparedness

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.

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.

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
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.

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)
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.

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.

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.

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.

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)
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.

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

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

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

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**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
fighting personnel, based at
Indianapolis International Airport.

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**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.

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**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.

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**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.

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Nail salon technicians learn about infection control and PPE in a training from NYCOSH.

(Photo courtesy of NJ/NY Hazardous Materials Worker Training Center)
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 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.
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)
Curricula, Media, and Publications

Curricula
Curricula are available in the Curricula Catalog, part of the National Clearinghouse for Worker Safety and Health Training (Clearinghouse).

Also, a Pathogen Safety Data (PSD) Guide and a PSD Training Module are available from the NIEHS WTP and the Clearinghouse. These materials clarify the use of PSD resources currently available for development of infectious disease occupational exposure control plans in a broad spectrum of industries. The PSD Guide reviews existing PSD resources and their strengths and limitations, and explains how to access them. The training module was developed to train workers with potential exposure to infectious pathogens on how to use the PSD Guide and resources.

Newsletter Articles and Media Coverage
“After the Ebola Outbreak: Lessons Learned,” Emory Medicine, Winter 2018

“Health Care Workers Receive Biosafety Training,” Alabama’s Health, Vol 51(2), July 2018, p. 4

University of Louisville Today radio interview with Paul McKinney, Feb. 20, 2017


“TMC partnership members take course on infectious diseases,” USW TMC News, Sept. 30, 2016

“UAB doctors to develop and implement infectious disease training across the South,” ABC News Affiliate in Birmingham, June 1, 2016

“Healthcare, telecommunications workers learn how to protect themselves against infectious diseases,” USW TMC News, Aug. 13, 2015

Work Highlighted by the Association of Schools and Programs of Public Health
“IU Bloomington Offers New Online Training About Post-flood Infectious Diseases and Hazards,” in partnership with P2R Academy in response to Hurricane Harvey, Oct. 4, 2017

“Louisville Preparedness Initiatives,” regarding work in the Emory Ebola Biosafety and Infectious Disease Response WTP consortium, Sept. 1, 2017

NIEHS Highlights
“Learning from the past, training for the future,” highlighting BIDTI, Environmental Factor, November 2017

“NIEHS staff honored with NIH Director’s Awards,” Environmental Factor, October 2017

“Infectious disease training improves airport worker preparedness,” highlighting DIDRT, Environmental Factor, July 2017

“Providing Worker Training to Improve Our Nation’s Infectious Disease Preparedness,” highlighting Emory University, Division of Extramural Research and Training success story

Video Training Highlights
Video summary from Lee County, Florida, EMS of an Emory University training and exercise of a transport from one of their local hospitals to an airfield

Rutgers University webinars led by the university biosafety officer:
• H7N9 Influenza Webinar
• Influenza Webinar
• Measles Webinar
Journal Articles and Commentaries


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.


NIH 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.