

# Protecting the Health and Safety of Workers Who Respond to Disasters: Achieving Equity Through Education and Training

**Policy Date:** October 29, 2024

**Policy Number:** 20246

*Note: Line numbers are included along the left to help quickly identify specific text within the policy brief.*

## Abstract

Workers who respond to disasters are disproportionately at risk of injury, illness, and death, resulting in devastating effects on communities. This policy statement aims to address the health and safety concerns workers face in disaster response and clean-up scenarios and underscores the need for equity, resilience, and capacity building through education and training. Opportunities to strengthen local, state, and federal responses to disasters are needed to ensure the equitable protection of workers across all occupations and backgrounds. Public health professionals must advocate for (1) the establishment of protocols for the proper enforcement of policies and programs related to the health and safety of disaster workers; (2) the provision of high-quality and effective health and safety training to disaster workers, including mental health curricula; and (3) the adoption of a systematic approach to training that includes resources to prepare workers for risks in all stages of disaster preparedness, response, and recovery. The inclusion of all people affected in the impacted communities will ultimately benefit the broader public health.

**Key words:** disaster response, occupational health and safety, training



23 **Relationship to Existing APHA Policy Statements**

- 24 • APHA Policy Statement 20223: Support Decent Work for All as a Public Health Goal in  
25 the United States
- 26 • APHA Policy Statement 20175: Ensuring Language Justice in Occupational Safety and  
27 Health Training
- 28 • APHA Policy Statement 20158: Preventing Occupational Transmission of Globally  
29 Emerging Infectious Disease Threats
- 30 • APHA Policy Statement 20157: Public Health Opportunities to Address the Health  
31 Effects of Climate Change
- 32 • APHA Policy Statement 20148: Ensuring Workplace Protections for Temporary Workers
- 33 • APHA Policy Statement 20138: Support for Workplace Injury and Illness Prevention  
34 Programs
- 35 • APHA Policy Statement 20105: Prioritizing Cleanup of the Hanford Nuclear Reservation  
36 to Protect the Public’s Health
- 37 • APHA Policy Statement 20091: Support for Community Health Workers to Increase  
38 Health Access and Reduce Health Inequities
- 39 • APHA Policy Statement 20078: Addressing the Urgent Threat of Global Climate Change  
40 to Public Health and the Environment
- 41 • APHA Policy Statement 20069: Response to Disasters: Protection of Rescue and  
42 Recovery Workers, Volunteers, and Residents Responding to Disasters
- 43 • APHA Policy Statement 20061: Addressing the Needs of Immigrants in Response to  
44 Natural and Human-Made Disasters in the United States
- 45 • APHA Policy Statement 20054: Occupational Health and Safety Protections for  
46 Immigrant Workers

47



48 **Problem Statement**

49 The Federal Emergency Management Agency (FEMA) defines a disaster as “[a]n occurrence of a  
50 natural catastrophe, technological accident, or human-caused event that has resulted in severe  
51 property damage, deaths, and/or multiple injuries.”[1] The September 11 terrorist attacks on the  
52 World Trade Center (WTC) and the distribution of anthrax in the U.S. postal system in 2001  
53 highlighted the urgency to integrate emergency preparedness and response with occupational  
54 safety and health and the need to protect disaster workers, defined as “those who are formally  
55 employed or volunteer during response and recovery efforts.” Disaster workers were found to be  
56 at increased risk of negative physical and mental health outcomes after the WTC disaster. WTC  
57 response and clean-up workers paid a high price in mortality and morbidity from hazards related  
58 to, among others, concrete, gypsum, fibrous glass, asbestos, particulate matter, and cellulose.[2]  
59 A 15-year follow-up study of WTC rescue and recovery workers demonstrated that responding  
60 within the first week of the disaster was associated with a 30% to 50% higher risk of heart  
61 disease mortality, smoking-related mortality, and all-cause mortality among nonfirefighters and  
62 non-general responder cohorts.[3]

63

64 ***Complex risk environment and health impacts***

65 Since the WTC events, the environmental risks and conditions workers face in response to  
66 disasters and subsequent clean-ups have continued to evolve in complexity. Disasters may be  
67 naturally occurring, such as hurricanes, earthquakes, and tornadoes, or human made, such as  
68 those involving chemical hazards, nuclear hazards, or biohazards. In addition, climate change has  
69 increased the number and severity of climate-related disasters. Thus, emphasis should be placed  
70 on preparing for disasters, particularly those now present in regions where such instances were  
71 historically limited or nonexistent.[4] According to the National Centers for Environmental  
72 Information, the annual average number of billion-dollar disasters has increased from three in the  
73 1980s to more than 100 such incidents every year.[5] With the increasing frequency and severity  
74 of extreme weather events, disaster workers—who have the dual role of living and working in



75 the affected communities—are most vulnerable to secondary hazards.[6,7] For example,  
76 hurricanes have resulted in downed power lines as well as poorly ventilated areas, increasing the  
77 risk of exposure to volatile organic compounds and to sewage that can cause infectious  
78 illnesses.[8,9] Subsequent clean-up activities can generate toxic dust, and direct contact with  
79 mold can cause severe, long-term, and sometimes irreversible damage to workers’ health.[8–10]  
80 Response and recovery efforts to disasters such as the Deepwater Horizon oil spill and the WTC  
81 attacks resulted in respiratory, hematological, and hepatic function abnormalities among first  
82 responders and clean-up workers.[8,10] Furthermore, some workers face additional barriers such  
83 as lack of knowledge and skills in properly donning and doffing personal protective equipment  
84 (PPE). Similarly, organizational-level factors can impede worker safety during response and  
85 recovery (e.g., availability of and access to appropriate PPE). Taken together, these challenges  
86 add to the complexity of disasters. [11,12]

87  
88 Increasingly, initial disaster response and clean up relies on community members and volunteers.  
89 This may include construction, landscaping, and renovation firms; out-of-state workers who  
90 temporarily relocate to the area; local volunteers; and those deployed from other regions.[13,14]  
91 Thus, many disaster volunteers may not be familiar with local policies, availability of PPE, and  
92 just-in-time (JIT) training opportunities.[14,15] In a study exploring the utility and risk  
93 associated with spontaneous volunteers, it was reported that 62% of organizations had used such  
94 volunteers in response activities; however, fewer than 20% consistently checked volunteers’  
95 credentials or performed employment/licensure verification and background checks.[12] This  
96 finding highlights lack of training, health and safety, liability, and alignment of expectations as  
97 the top challenges in using volunteers in response and recovery; yet, nongovernmental voluntary  
98 disaster response organizations may not be structured to incorporate volunteers, evaluate their  
99 competencies, and manage their training gaps effectively.[16]

100



101 Likewise, disaster work has been known to adversely affect an individual’s mental health.[17]  
102 Disaster workers may experience injuries firsthand or experience secondary trauma, such as  
103 witnessing an affected community’s physical destruction and emotional distress.[18] Job stress  
104 may also impact disaster workers’ interpersonal relationships, with spouses often assuming a  
105 supportive role, frequently at the expense of their own comfort and well-being.[19] Furthermore,  
106 due to work assignments, workers may experience stress caused by long separations from their  
107 social support systems.[20] For example, a 2023 Substance Abuse and Mental Health Services  
108 Administration (SAMHSA) research bulletin highlighted the behavioral health effects of  
109 disasters.[21] While rates of postdisaster posttraumatic stress disorder (PTSD) varied depending  
110 on the type of event, PTSD can have prolonged effects. Approximately 30% of disaster survivors  
111 will also experience major depressive disorder.[21] It is important to note, however, that despite  
112 increasing attention to mental health in recent years, the incidence of diagnosed PTSD,  
113 depression and anxiety disorders, substance use disorders, and self-harm may be unknown as a  
114 result of fragmented health care access and follow-up among disaster workers.[18,19,22]

115

### 116 ***Vulnerable worker populations***

117 In addition to numerous safety and health hazards, disaster workers may face occupational health  
118 disparities. The National Institute for Occupational Safety and Health (NIOSH) defines  
119 occupational health disparities as “avoidable differences in work-related disease incidence,  
120 mental illness, or morbidity and mortality that are closely linked with social, economic, and/or  
121 environmental disadvantage such as work arrangements, sociodemographic characteristics, and  
122 organizational factors.” [23]

123

124 Exploitative working and living conditions among clean-up workers are common. A study of day  
125 laborers revealed that immigrant workers were on the frontlines to assist residents and business  
126 owners. These day laborers served as a “just-in-time workforce of ‘second responders’” to take  
127 on laborious and hazardous work such as debris removal, structure demolition, and building  
128 remediation.[24] Employers may hire non–English-speaking workers to avoid complying with



129 occupational safety and health conditions and standard employment terms.[25] Wages can be  
130 low, even below the legal minimum, and workers can face intimidation and retaliation (e.g.,  
131 termination, deportation) when voicing concerns about dangerous working or living  
132 conditions.[26]

133  
134 Our efforts must underscore our commitment to delivering the best available services, training,  
135 and prevention strategies as part of an all-hazards approach, especially for historically excluded  
136 and vulnerable populations. The all-hazards approach is an integrated system that emphasizes  
137 commonalities among the full spectrum of emergencies and disasters, rather than a specific type  
138 of hazard, in planning for preparedness, response, and recovery. In this way, capabilities and  
139 capacities for a broad array of hazards can be developed for specific locations, including the  
140 most vulnerable communities.[27] These resources should be directed to those who may reside in  
141 the most at-risk environments, including communities in flood-prone areas or in proximity to  
142 manufacturing facilities or hazardous waste sites. Black, indigenous, and people of color  
143 (BIPOC) communities, as well as other disadvantaged communities, face systemic inequities  
144 (e.g., inequities related to the built environment, infrastructure, and environmental exposures)  
145 and are disproportionately affected by climate change, disasters, and actions that impede  
146 equity.[28] Consequently, individuals residing in these communities are prone to facing the  
147 repetitive burden of exposure to adverse health, social, and economic impacts of disasters that  
148 place their communities, disaster workers, and volunteers at peril.[29] Ensuring the protection of  
149 disaster workers involves inclusive training, hazard and risk assessments, provision of  
150 appropriate PPE, and injury and health surveillance.[30]

151  
152 ***Current policies and standards***

153 NIOSH and the Occupational Safety and Health Administration (OSHA) provide guidance,  
154 recommended practices, and resources for worker safety and health (WSH) issues at the federal



155 level. However, only OSHA has the authority to enforce standards employers must comply with  
156 to protect WSH.

157

158 OSHA’s Hazardous Waste Operations and Emergency Response standard (HAZWOPER) is  
159 designed to protect workers involved in hazardous waste operations and emergency response  
160 activities.[31] The standard applies to scenarios including clean-up operations at uncontrolled  
161 hazardous waste sites; operations involving hazardous waste at treatment, storage, and disposal  
162 facilities; and emergency response operations for hazardous substance releases. A site-specific  
163 health and safety plan, training and refreshers for site workers, PPE tailored to specific hazards,  
164 and a comprehensive emergency response plan are key components of HAZWOPER  
165 compliance. In addition, medical exams and consultations are required for employees exposed to  
166 hazardous substances above certain thresholds for significant periods. However, HAZWOPER  
167 does not cover all local or governmental workplaces, and only 29 states have OSHA-approved  
168 state plans that protect local and government workers. Volunteers who are not covered by OSHA  
169 may be covered by the state plans. In such situations, the U.S. Environmental Protection  
170 Agency’s HAZWOPER regulations cover compensated and uncompensated (volunteer) workers  
171 engaged in HAZWOPER operations.[32]

172

173 The HAZWOPER standard is the basis as well for the National Institute of Environmental Health  
174 Sciences (NIEHS) Worker Training Program (WTP), which has been applied in numerous  
175 disaster and hurricane clean-up operations to protect WSH since the implementation of  
176 HAZWOPER in 1990.[33] NIEHS also publishes guidelines and materials to protect clean-up  
177 workers from debris, mold, oil spills, and other hazardous materials.[34]

178

179 There are, however, inadequacies in the current training and regulatory framework for  
180 emergency responders, highlighting the need for comprehensive, up-to-date standards that  
181 address the full range of hazards and their respective training, equipment, and technology



182 support.[30] Older standards may not reflect the latest knowledge, technology, and practices in  
183 emergency response and may be outdated in addressing contemporary hazards and  
184 challenges.[35,36] For instance, OSHA Fire Brigades Standard 29 CFR 1910.156 (1980)  
185 established requirements for the organization and training of and equipment for fire brigades,  
186 which are groups of employees organized to respond to fires and other emergencies.[37] To  
187 address some of these deficiencies, the proposed 2024 OSHA Emergency Response Standard is  
188 intended to replace the Fire Brigades Standard and cover a broader range of emergency  
189 responders, including technical search workers, rescue workers, and emergency medical service  
190 providers.[38] However, it is proposed as a “performance-based” standard, which may not align  
191 entirely with the Department of Homeland Security’s National Incident Management System  
192 (detailed subsequently).

193

194 Moreover, OSHA lacks sufficient inspectors and resources to protect all at-risk workers during  
195 the entire disaster cycle.[39] For example, even though standard contract terms for response  
196 operations funded by FEMA require compliance with wage and hour regulations and providing a  
197 safe working environment, enforcement of OSHA standards is often lacking due to limited  
198 funding and staffing.[40]

199

### 200 ***Integration of disaster workers’ safety in federal agencies, systems, and frameworks***

201 FEMA provides community training and education to build local capacity before, during, and  
202 after disasters.[41] FEMA’s involvement in worker safety can be categorized into several key  
203 areas: establishment of safety protocols and guidelines; training and education through courses  
204 related to such areas as PPE, hazard recognition, and safe work practices through the Emergency  
205 Management Institute and the National Training and Education Division; and collaboration with  
206 OSHA. In addition, FEMA provides comprehensive safety protocols and guidelines for disaster  
207 response activities and deploys officers to monitor safety conditions at disaster sites. However, it





208 is important to note that, unlike OSHA, FEMA does not have regulatory power to enforce WSH  
209 regulations.

210

211 The Worker Safety and Health Support Annex, a collaborative document between OSHA and  
212 FEMA, outlines the framework for ensuring WSH during disaster response operations.[42] The  
213 annex highlights roles, responsibilities, coordination mechanisms, and resources required for  
214 protecting response and recovery workers. It also details collaborations among local, state, and  
215 federal agencies such as state occupational safety and health agencies, local health departments,  
216 emergency management offices, and local worker safety and health organizations to implement  
217 safety protocols effectively.

218

219 The National Incident Management System provides a systematic, proactive approach to guide  
220 agencies and organizations at all levels of government, the private sector, and nongovernmental  
221 organizations in working to prevent, protect against, respond to, recover from, and mitigate the  
222 effects of incidents. The system integrates with other emergency management and response  
223 systems, such as the National Response Framework, to provide a cohesive approach to managing  
224 incidents. [43,44] Furthermore, it establishes standardized processes and procedures such as  
225 incident command systems for coordination and collaboration among various agencies and  
226 organizations to ensure interoperability and effective communication during emergencies. Safety  
227 officer is a key position of the command staff whose responsibility is to ensure the safety of all  
228 incident personnel. This includes identifying potential hazards and developing measures to  
229 mitigate risks. The safety officer's responsibilities also require continuously monitoring,  
230 assessing, and mitigating hazards; developing safety plans; and conducting safety briefings to  
231 inform incident personnel about specific hazards, protective measures, and procedures for  
232 reporting unsafe conditions. If unsafe conditions are identified, the safety officer has the  
233 authority to stop or alter activities. It should be noted that safety officers' responsibilities are



234 limited to the response phase and do not extend beyond that. Therefore, they are not required to  
235 train personnel, including volunteers on site.

236

237 As one of the strategic preparedness and response operations of the U.S. Department of Health  
238 and Human Services (DHHS), the Medical Reserve Corps (MRC) is a national network of more  
239 than 300,000 volunteers that plays a critical role in disaster response by augmenting local public  
240 health, medical, and emergency response systems.[45] The MRC provides surge capacity,  
241 administers vaccinations and supports mass care operations, educates the public about  
242 emergency preparedness and health promotion, and assists with logistics and coordination during  
243 disasters.

244

## 245 **Evidence-Based Strategies to Address the Problem**

### 246 ***A comprehensive health and safety training system for disaster workers***

247 Worker safety training, an administrative control, is one component in the hierarchy of controls  
248 to prevent injury and illness.[46] Evidence shows that providing worker safety training, both  
249 before and after an emergency event, increases the likelihood of safer work practices in high-risk  
250 environments.[30,47] Worker training should focus on instituting safety principles and  
251 emergency preparedness to identify potential hazards and assess risks; ensuring proper selection,  
252 use, and maintenance of PPE; ensuring that workers know evacuation routes, emergency contact  
253 information, and first-aid basics; establishing a clear chain of command and communication  
254 channels; and conducting regular drills to practice responses to various emergency scenarios.  
255 This type of training is helpful even when specific hazards are unknown.

256

257 Training should be designed and delivered to adhere to principles of adult learning including  
258 interactive/engaging learning methods, ensuring greater knowledge and skill acquisition for a  
259 diverse disaster response and recovery workforce. [48–50] There is substantial evidence of the



260 effectiveness of training in enhancing workers’ safety performance. Adoption of multilingual and  
261 inclusive safety training methods, as required by OSHA, has been found useful in addressing  
262 language and literacy limitations among volunteers, migrants, and other clean-up  
263 workers.[48,51] A multisource evaluation demonstrated that safety training should proactively  
264 consider language, literacy levels, and cultural traditions of a diverse workforce to enhance  
265 effectiveness and impact.[48] Ensuring the availability of JIT training for first responders,  
266 especially training involving chemical, biological, and radiological hazards, has been found to be  
267 useful in significantly improving knowledge levels.[52] Meta-analysis study findings have  
268 further shown the relative effectiveness of engaging safety training methods, with up to three  
269 times greater gains in safety knowledge acquisition and demonstration of safety practices in  
270 cases where hazard event/severity is high.[47,48]

271

### 272 ***Preparedness and monitoring of health conditions***

273 Robust standards to assess and mitigate the health risks involved with assigned tasks for disaster  
274 workers must be met to fully protect disaster recovery workers and first responders. The Centers  
275 for Disease Control and Prevention (CDC) Emergency Responder Health Monitoring and  
276 Surveillance system provides guidance to organizations on monitoring and tracking health  
277 effects and predeployment medical reviews. The National Response Team recommends that  
278 voluntary organizations responding to disasters adopt components of the CDC system.[53]  
279 Ongoing surveillance of hazard exposure, medical risk, and availability of care is key to  
280 maintaining a healthy and willing workforce. Such surveillance could include creating a worker  
281 roster on site to ensure follow-up, medical evaluation and monitoring, support (mental health,  
282 support groups), and resources (e.g., the 9/11 Victim Compensation Fund).[54–56] At present,  
283 first responder data on injuries, illnesses, and fatalities available through the U.S. Bureau of  
284 Labor Statistics do not account for participation in disaster response or include informal and  
285 volunteer workers.[57] This impedes our ability to systematically monitor, analyze, interpret, and  
286 disseminate illness and injury data related to an event’s emergency responder population. To  
287 ensure that disaster response workers are aware of health conditions, several strategies including



288 education, training, monitoring, and support systems need to be implemented. One such example  
289 is the SAMHSA First Responders and Disaster Responders Resource Portal, which offers a  
290 comprehensive range of resources to support the behavioral health of first responders.[58] The  
291 portal includes training and resources aimed at various worker populations such as those  
292 employed in disaster management, law enforcement, fire services, and emergency medical  
293 services.

294

295 ***Safety and health needs of a diverse workforce that includes marginalized and vulnerable***  
296 ***populations***

297 The NIEHS WTP is an example of a national effort to provide disaster response and clean-up  
298 training. This highly engaging and interactive health and safety training is peer led and includes  
299 hands-on demonstrations and exercises.[50,59] Historical evaluations have shown that the WTP  
300 is effective in preparing a diverse disaster response and recovery workforce that includes  
301 community volunteers.[48,50,59] Several community-based organizations and unions have  
302 provided training to enhance community workforce capacity for disaster response and recovery.  
303 One such organization, Make the Road, New York, readily responded to Hurricane Sandy  
304 because of its cadre of trained people and was able to train immigrant day laborers.[60] The Gulf  
305 Responder Resilience Training Project, developed by NIEHS and SAMHSA, was designed with  
306 input from community members to reflect the unique mental health needs and cultural contexts  
307 of workers and volunteers in disaster-prone regions. The participatory approach used in the  
308 project encouraged interactions and communications among participants that ultimately  
309 improved workforce capacity and enhanced local preparedness efforts and community  
310 awareness. [61,62]

311

312 The NIEHS WTP has also documented the effectiveness of mental health support for promoting  
313 engagement in positive health behaviors and reducing the incidence of mental health  
314 symptoms.[63,64] Awareness-level training for first responders, workers, and supervisors is



315 recognized as a useful intervention to impart the skills needed to initiate an emergency response,  
316 particularly for vulnerable worker subpopulations living in and around disaster-affected areas.  
317 More specifically, an evaluation of a NIEHS WTP resiliency training program involving  
318 professional and volunteer workers who responded to Hurricane Sandy revealed greater  
319 improvements in healthy lifestyle behaviors, stress management control, and mental health  
320 among responders who received resiliency training.[64]

321

322 These types of training and related resources should be used as part of a whole community  
323 approach that recognizes the needs and capabilities of the community, including volunteer  
324 workers.[65] For example, OSHA and NIEHS provide multilingual, culturally appropriate, and  
325 inclusive safety materials that address language and literacy concerns and are readily available  
326 and easily accessible.[30,66] These materials provide core disaster training resources that can be  
327 complemented with site-specific, JIT training provided by key community partners to prepare  
328 volunteers for the activities they will engage in and the hazards they may encounter in an  
329 efficient and cost-effective manner. Furthermore, MRC volunteers are a potential resource for  
330 training in mass care, medical surge, and health education.[45] Local community partners can  
331 collaborate with the MRC in training volunteer disaster workers where such expertise is needed.

332

### 333 ***Leadership and organizational support***

334 Leadership support is crucial for the effectiveness and impact of training programs.  
335 Transparency, accountability, engaging relations, and shared decision making enhance worker  
336 performance during the response and recovery phases. [67,68] This also requires leadership to  
337 have a thorough understanding of workers' social circumstances as well as existing support  
338 systems and systemic barriers that might be exacerbated during and after a disaster.[69]

339



340 Organizational support and related policies to address disaster workers’ personal needs (e.g.,  
 341 child care) have been shown to enhance their willingness to report to work and boost their  
 342 confidence during response.[70] In 2020, the Florida Department of Education’s Office of Early  
 343 Learning, in coordination with local organizations, prioritized and increased access to child-care  
 344 services for first responders and health care professionals.[71] However, such arrangements are  
 345 often infrequent, inaccessible, or cost prohibitive.[72] Research justifies the need to assist  
 346 employees and volunteer workers throughout disaster relief operations. An inclusive approach,  
 347 open communication, and employer-employee trust building are crucial components of effective  
 348 leadership and organizational support.[73]

349

350 **Alternative Strategies**

351 An alternative strategy could be excluding volunteers from requirements for safety training  
 352 because it would be impractical to conduct and potentially delay response activities. This  
 353 alternative, however, disregards foundational principles of public health that policies and  
 354 practices should be ethical and equitable. Emergency responders and recovery workers who are  
 355 volunteers should be provided appropriate health and safety protections, just as are paid workers  
 356 who face the same hazards.

357

358 **Action Steps to Implement Evidence-Based Strategies**

	<b>Evidence-Based Strategy</b>		<b>Action Steps</b>
1	Establish a comprehensive health and safety training system for disaster workers.	1a	OSHA and FEMA should ensure that training providers use a systematic training and educational process that includes a needs analysis, identification of contextual factors/barriers to safety and health, and continuous quality improvement. This process should

			include local agencies and nonprofit organizations involved in disaster response and recovery.
		1b	OSHA and FEMA should ensure that training providers incorporate principles of adult learning, including use of local partners to ensure contextual and cultural relevance for the disaster workforce (including volunteers).
		1c	OSHA and FEMA should ensure the availability of JIT for first responders, including adoption of innovative training technologies. Training providers must have the administrative and physical structures needed to provide site-specific and hazard-specific training, including curricula, trainers, initial training supplies and equipment, classroom facilities, and mobile training vans.
2	Include planning and preparedness activities.	2a	FEMA, in consultation with local and state disaster response agencies, should conduct a predeployment medical screening that ensures “fitness for duty” to assess and mitigate the health risks involved with assigned tasks for individual workers.
		2b	FEMA, in consultation with local and state disaster response agencies, should ensure joint planning and exercising of the safety management plan to adopt

			robust standards that reliably protect disaster recovery workers and first responders.
		2c	FEMA, in consultation with local and state disaster response agencies, should conduct ongoing surveillance of hazardous exposures, medical risks, and availability of care to maintain a healthy and willing workforce and inform targets for workforce staffing goals.
		2d	Analysis of data on illness, injury, mortality, and environmental trends is critical not only after a disaster but before a disaster. Incident command officials should implement a surveillance system in line with CDC’s Emergency Responder Health Monitoring and Surveillance system to improve understanding regarding the scope of hazardous exposures, medical risks, and availability of care to help design evidence-based strategies in the planning phase.
3	Address the safety and health needs of a diverse workforce that includes marginalized and vulnerable populations.	3a	Emergency management must work closely with community and volunteer workers to ensure accessibility of core disaster and JIT resources for worker safety using a whole community approach that addresses community capabilities and needs.



		3b	OSHA and SAMHSA must ensure that training providers offer opportunities for training in mental health, coping strategies, and resilience building for workers, managers, and supervisors to promote engagement in complementary health behaviors and reduce the incidence of mental health symptoms.
		3c	OSHA, SAMHSA, and DHHS, in conjunction with state and local disaster response providers, should adopt policies and practices directed at specific barriers to protecting disaster workers during response and recovery (e.g., PPE access, child-care needs), including increased availability of resources to promote worker resilience and well-being.
4	Incorporate leadership and performance monitoring.	4a	FEMA, in conjunction with local and state disaster response agencies, should appoint a competent, experienced leadership team for each disaster response and recovery effort and establish an integrated governance body to ensure successful long-term recovery.
		4b	FEMA, in conjunction with local and state disaster response agencies, should encourage collaboration and coordination among disaster workers and other interested parties with an emphasis on transparency, accountability, and shared decision making to

			enhance health and safety during the response and recovery phases.
		4c	FEMA, in conjunction with local and state disaster response agencies, should ensure that training providers conduct analyses to demonstrate the impact of disaster worker training and related policies and practices on the health and safety of disaster workers and affected communities (e.g., cost/benefit, return on investment, utility analysis).

359

360 **Opposing Arguments**

361 One argument against preparing workers for safety hazards when responding to disasters is  
 362 whether the costs exceed the benefits. However, preliminary evidence of the positive economic  
 363 impacts of worker training programs has been demonstrated nationwide, including decreases in  
 364 the number of injuries. These economic impacts include the direct cost of medical care as well as  
 365 the indirect costs of lost wages and personal suffering. NIEHS WTP training and related  
 366 resources saved \$717 million in government expenditures from 1995 through 2013, or roughly  
 367 \$40 million annually.[74] The direct cost saving from safety and injury prevention has been well  
 368 documented in similar workforce development programs in disadvantaged communities.[75]

369

370 Another opposing argument could be that there is inadequate evidence of serious injuries or  
 371 illnesses experienced by clean-up and recovery workers. This is due to inadequate surveillance  
 372 structures during disaster recovery, as discussed above.[57]

373



374 Lastly, one could argue that disaster worker training currently lacks enforcement of a specific  
375 standard. This is particularly relevant given that many of the most vulnerable disaster workers  
376 are unaware of these standards and less likely to exercise their rights and that employers are not  
377 held accountable because of lack of enforcement. Another issue is that these workers are often  
378 volunteers, and OSHA standards do not apply without an employee/employer relationship.

379

### 380 **Conclusion**

381 Protecting the health and safety of disaster workers during response and recovery efforts by  
382 focusing on achieving equity through education and training is imperative. As disasters become  
383 more frequent and related response and recovery work increases in complexity, many current  
384 occupational health and safety standards will not adequately address new hazards. Developing  
385 such a policy is essential for protecting disaster workers, promoting equity, adapting to modern  
386 challenges, ensuring legal compliance, and maintaining public trust. We must ensure that all  
387 workers, regardless of their background or status, are equipped with the necessary skills and  
388 resources to perform their duties safely and effectively.



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